



*Personal Computer
Hardware Reference
Library*

Hardware Maintenance and Service

Volume 2

LIMITED WARRANTY

The International Business Machines Corporation warrants this IBM Personal Computer Product to be in good working order for a period of 90 days from the date of purchase from IBM or an authorized IBM Personal Computer dealer. Should this Product fail to be in good working order at any time during this 90-day warranty period, IBM will, at its option, repair or replace this Product at no additional charge except as set forth below. Repair parts and replacement Products will be furnished on an exchange basis and will be either reconditioned or new. All replaced parts and Products become the property of IBM. This limited warranty does not include service to repair damage to the Product resulting from accident, disaster, misuse, abuse, or non-IBM modification of the Product.

Limited Warranty service may be obtained by delivering the Product during the 90-day warranty period to an authorized IBM Personal Computer dealer or IBM Service Center and providing proof of purchase date. If this Product is delivered by mail, you agree to insure the Product or assume the risk of loss or damage in transit, to prepay shipping charges to the warranty service location and to use the original shipping container or equivalent. Contact an authorized IBM Personal Computer dealer or write to IBM Personal Computer, Sales and Service, P.O. Box 1328-W, Boca Raton, Florida 33432, for further information.

ALL EXPRESS OR IMPLIED WARRANTIES FOR THIS PRODUCT INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED IN DURATION TO A PERIOD OF 90 DAYS FROM THE DATE OF PURCHASE, AND NO WARRANTIES, WHETHER EXPRESS OR IMPLIED, WILL APPLY AFTER THIS PERIOD. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATIONS MAY NOT APPLY TO YOU.

IF THIS PRODUCT IS NOT IN GOOD WORKING ORDER AS WARRANTED ABOVE, YOUR SOLE REMEDY SHALL BE REPAIR OR REPLACEMENT AS PROVIDED ABOVE. IN NO EVENT WILL IBM BE LIABLE TO YOU FOR ANY DAMAGES, INCLUDING ANY LOST PROFITS, LOST SAVINGS OR OTHER INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OF OR INABILITY TO USE SUCH PRODUCT, EVEN IF IBM OR AN AUTHORIZED PERSONAL COMPUTER DEALER HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, OR FOR ANY CLAIM BY ANY OTHER PARTY.

SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES FOR CONSUMER PRODUCTS, SO THE ABOVE LIMITATIONS OR EXCLUSIONS MAY NOT APPLY TO YOU.

THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH MAY VARY FROM STATE TO STATE.



*Personal Computer
Hardware Reference
Library*

Hardware Maintenance and Service

Volume 2

First Edition (February 1984)

Use this publication only for the purpose stated in the Preface.

It is possible that this material may contain reference to, or information about, IBM products (machines or programs), programming, or services that are not announced in your country. Such references or information must not be construed to mean that IBM intends to announce such IBM products, programming, or services in your country.

Changes are made periodically to the information herein; these changes will be incorporated in new editions of this publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this manual at any time and without notice.

FEDERAL COMMUNICATIONS COMMISSION RADIO FREQUENCY INTERFERENCE STATEMENT

Warning: This equipment has been certified to comply with the limits for a Class B computing device, pursuant to Subpart J of Part 15 of FCC rules. Only peripherals (computer input/output devices, terminals, printers, etc.) certified to comply with the Class B limits may be attached to this computer. Operation with non-certified peripherals is likely to result in interference to radio and TV reception.

INSTRUCTIONS TO USER

This equipment generates and uses radio frequency energy and if not installed and used properly, i.e., in strict accordance with the operating instructions, reference manuals, and the service manual, may cause interference to radio or television reception. It has been tested and found to comply with the limits for a Class B computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a residential installation.

If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient the receiving antenna.
- Relocate the equipment with respect to the receiver.
- Move the equipment away from the receiver.
- Plug the equipment into a different outlet so that equipment and receiver are on different branch circuits.
- If peripherals not offered by IBM are used with this equipment, it is suggested that you use shielded, grounded cables with in-line filters, if necessary.

If necessary consult your dealer service representative for additional suggestions.

The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. It is the responsibility of the user to correct such interference.

CAUTION

This product is equipped with a line cord and plug for the user's safety. It is to be used with a properly grounded receptacle to avoid possible electrical shock.

Preface

This manual provides the information needed to isolate and repair failures of the IBM Portable Personal Computer system. Readers should have received training on this system.

This manual is contained in two volumes. Volume 1 includes Sections 1, 2, and 3. Volume 2 includes Sections 4, 5, 6, and 7.

SECTION 1, "INTRODUCTION," provides a general description of the IBM Portable Personal Computer and its options.

SECTION 2, "INTRODUCTION TO DIAGNOSTICS," contains the diagnostic menu reference and explains the three diagnostic aids.

SECTION 3, "PROBLEM ISOLATION CHARTS," provides step-by-step instructions that lead you to the failing field replaceable unit (FRU).

SECTION 4, "LOCATIONS," shows the locations of the various components in the IBM Portable Personal Computer system.

SECTION 5, "REMOVAL/REPLACEMENT AND ADJUSTMENTS," has all information needed to remove, replace, and adjust any of the FRUs in the IBM Portable Personal Computer system.

SECTION 6, "SWITCH SETTINGS," provides the switch settings, jumper positions, and setup information for the IBM Portable Personal Computer system.

SECTION 7, "PARTS CATALOG," contains illustrations and part numbers for all of the FRUs.

IBM Portable Personal Computer operating instructions are found in the *Guide to Operations*, IBM item number 6936571. Detailed hardware and interface information is found in the *IBM Portable Personal Computer Addendum to the Technical Reference*, IBM item number 6936572 and the *Personal Computer XT Technical Reference*, IBM item number 6025005.

Contents

SECTION 1. INTRODUCTION	1-1
Introduction	1-3
SECTION 2. INTRODUCTION TO DIAGNOSTICS	2-1
Introduction	2-3
Power-On Self Test	2-3
POST Errors	2-5
Problem Isolation Charts (PICs)	2-7
Advanced Diagnostics	2-9
Special Key Functions	2-10
Diagnostic Menus	2-11
Options Selection menu	2-11
Installed Devices	2-12
System Checkout	2-13
Test Selection	2-14
Log Utilities	2-17
Color/Graphics Monitor Adapter	2-18
Diskette Drive and Adapter	2-20
Fixed Disk Drive and Adapter	2-21
Required Tools and Test Equipment	2-22
SECTION 3. PROBLEM ISOLATION CHARTS	3-1
Start	3-3
Undetermined Problem	3-010-1
Power	3-020-1
System Board	3-100-1
Memory	3-200-1
Keyboard	3-300-1
Display	3-500-1
Diskette Drive	3-600-1
Math Coprocessor	3-700-1
Printer Adapter	3-900-1
Asynchronous Communications Adapter	3-1100-1

Alternate Asynchronous Communications Adapter	3-1200-1
Game Control Adapter	3-1300-1
Graphics Printer	3-1400-1
Synchronous Data Link Control Adapter	3-1500-1
Fixed Disk Drive	3-1700-1
Expansion Unit	3-1800-1
Binary Synchronous Communications Adapter	3-2000-1
Alternate Binary Synchronous Communications Adapter	3-2100-1
Cluster Adapter	3-2200-1
Compact Printer	3-3300-1
SECTION 4. LOCATIONS	4-1
System Unit	4-3
System Board	4-7
Color/Graphics Monitor Adapter	4-9
Diskette Drive Adapter	4-9
Keyboard	4-10
U.S. English Keyboard	4-11
U.K. English Keyboard	4-12
Spanish Keyboard	4-13
French Keyboard	4-14
German Keyboard	4-15
Italian Keyboard	4-16
Diskette Drive	4-17
10 Megabyte Fixed Disk Drive	4-19
IBM Graphics Printer	4-21
Compact Printer	4-27
Expansion Unit	4-29
Expansion Board	4-31
Extender Card	4-32
Receiver Card	4-32
Options and Option Adapters	4-33
Asynchronous Communications Adapter and Adapter Address Module	4-33
Communications Adapter Cable	4-34
Fixed Disk Adapter	4-34
Game Control Adapter	4-35
64/256KB Memory Expansion Option Adapter	4-35

Printer Adapter	4-36
Prototype Card	4-36
Binary Synchronous Communications Adapter and Adapter Address Jumper	4-37
Synchronous Data Link Control Communications Adapter	4-37
Cluster Adapter	4-38
Color Display	4-39
Option Locations	4-40
Input Voltage Selector Switch Location	4-41
Safety Ground Locations	4-42
System Unit	4-42
Expansion Unit Power Supply	4-43
IBM Graphics Printer	4-44
IBM Color Display	4-45
IBM Compact Printer	4-46
IBM Color Printer	4-47
IBM Internal Display	4-48

SECTION 5. REMOVAL/REPLACEMENT AND

ADJUSTMENTS	5-1
System Unit	5-6
Cover Removal 1005	5-6
Cover Replacement 1006	5-8
Front Panel Removal 1010	5-9
Front Panel Replacement 1011	5-11
Power Supply	5-14
Power Supply Removal 1015	5-14
Power Supply Replacement 1016	5-17
Power Supply Fan Removal 1020	5-19
Power Supply Fan Replacement 1021	5-20
System Board	5-21
System Board Removal 1025	5-21
System Board Replacement 1026	5-23
64KB Memory Module Removal 1030	5-25
64KB Memory Module Replacement 1031	5-27
Math Coprocessor Removal 1035	5-28
Math Coprocessor Replacement 1036	5-30
8088 Processor Removal 1040	5-35
8088 Processor Replacement 1041	5-37
Speaker Removal 1045	5-39

Speaker Replacement 1046	5-40
Keyboard	5-41
Keyboard Removal 1050	5-41
Keyboard Replacement 1051	5-42
Keyboard Cover Removal 1055	5-43
Keyboard Assembly Removal 1060	5-44
Keyboard Assembly Replacement 1061	5-45
Internal Keyboard Cable Removal 1062	5-46
Internal Keyboard Cable Replacement 1063 ...	5-48
Displays	5-50
Internal Display Removal 1065	5-50
Internal Display Replacement 1066	5-55
IBM Color Display Removal 1070	5-61
IBM Color Display Replacement 1071	5-62
Color Trimmer Capacitor Adjustment	5-63
Vertical Hold Adjustment	5-64
Vertical Size Adjustment	5-65
Diskette Drive	5-66
Diskette Drive Removal 1075	5-66
Diskette Drive Replacement 1076	5-71
Drive Belt Removal 1080	5-74
Drive Belt Replacement 1081	5-74
Drive-Motor Preliminary Speed Adjustment ...	5-75
Drive Motor Speed Adjustment	5-79
Option Adapters	5-83
Color/Graphics Monitor Adapter Removal 1085	5-83
Color/Graphics Monitor Adapter Replacement	
1086	5-85
Diskette Drive Adapter Removal 1090	5-87
Diskette Drive Adapter Replacement 1091 ...	5-88
Option Adapter Removal 1095	5-90
Option Adapter Replacement 1096	5-92
Fixed Disk Drive	5-93
Drive C Removal 2000	5-93
Drive C Replacement 2001	5-96
Drive D Removal 2005	5-100
Drive D Replacement 2006	5-103
Expansion Unit	5-107
Expansion Board Removal 2010	5-107

Expansion Board Replacement 2011	5-109
Expansion Unit Cover Removal 2015	5-111
Expansion Unit Cover Replacement 2016	5-112
Expansion Unit Power Supply Removal 2020 .	5-113
Expansion Unit Power Supply Replacement 2021	5-119
Expansion Unit Option Adapters	5-120
Option Adapter Removal 2025	5-120
Option Adapter Replacement 2026	5-121
Fixed Disk Adapter Removal 2030	5-122
Fixed Disk Drive Adapter Replacement 2031 .	5-124
IBM Graphics Printer	5-127
Carriage Belt Adjustment	5-127
Carriage Belt Removal 2100	5-130
Carriage Belt Replacement 2105	5-133
Carriage Drive Assembly Removal	
2110	5-135
Carriage Drive Assembly Replacement 2115	5-137
Control Circuit Card Removal 2120	5-140
Printer Dip Switch Chart	5-144
Control Circuit Card Replacement 2125 .	5-146
Driver Circuit Card Removal 2130	5-149
Driver Circuit Card Replacement 2135	5-151
Control Panel Removal 2140	5-152
Control Panel Replacement 2145	5-153
Access Cover Removal 2150	5-154
Top Cover Removal 2155	5-155
Top Cover Replacement 2160	5-158
Base Cover Removal 2165	5-161
Base Cover Replacement 2170	5-162
Forms Feed Knob Removal 2175	5-163
Forms Rack Removal 2180	5-164
Forms Tractor Removal 2185	5-165
Forms Tractor Replacement 2190	5-167
Fuse Removal 2195	5-168
Fuse-Filter Card Removal-220/240 Volt	
2200	5-169
Fuse-Filter Card Replacement--220/240 Volt	
2205	5-171

Fuse-Filter Card/Power Cord Removal--120	
Volt 2210	5-173
Fuse-Filter Card/Power Cord	
Replacement--120 Volt 2215	5-175
Heat Sink/Power Transistor Assembly Removal	
2220	5-177
Heat Sink/Power Transistor Assembly	
Replacement 2225	5-178
Intermediate Gear Removal 2230	5-179
Intermediate Gear Replacement 2235 .	5-181
Left Margin Sensor Adjustment	5-183
Left-Margin Sensor Removal 2240	5-190
Left-Margin Sensor Replacement 2245	5-192
Power Transformer Removal--220/240 Volt	
2250	5-194
Power Transformer, 220/240-Volt, Primary	
Power Connector Wiring Check	5-196
Power Transformer Replacement--220/240 Volt	
2255	5-197
Power Transformer Removal--120 Volt	
2260	5-198
Power Transformer Replacement--120 Volt	
2265	5-200
Print Head Removal 2270	5-201
Print Head Replacement 2275	5-203
Print Head Gap Adjustment 2280	5-205
Print Mechanism Assembly Removal 2285 .	5-206
Print Mechanism Assembly Replacement	
2290	5-208
Ribbon Shield Removal 2295	5-211
Ribbon Shield Replacement 2300	5-212
Safety Shield Removal 2305	5-214
Compact Printer	5-215
Top Cover Removal 6000	5-215
Top Cover Replacement 6005	5-218
Print Mechanism Removal 6010	5-219
Print Mechanism Replacement 6015	5-220
Logic Card Removal 6020	5-222
Logic Card Replacement 6025	5-224

SECTION 6. SWITCH SETTINGS	6-1
System Board	6-4
Switch 1: POST Mode	6-5
Switch 2: Math Coprocessor	6-6
Switches 3 and 4: System Board Memory	6-7
Switches 5 and 6: Display Type	6-8
Switches 7 and 8: Diskette Drive	6-9
Extender Card	6-10
Memory Expansion Option	6-11
Cluster Adapter Switch Settings	6-12
 SECTION 7. PARTS CATALOG	 7-1
Limited Warranty Statement	7-2
How To Use This Parts Catalog	7-3
Visual Index	7-4
System Unit (5155)	7-5
Expansion Unit (5161)	7-10
Color Display (5153)	7-14
Diskette Drive	7-16
Fixed Disk Drive	7-18
Keyboard	7-20
Keybutton Part Numbers — U.S.	7-22
Graphics Printer (5152)	7-26
Compact Printer	7-30
Power Cord	7-32
 INDEX	 index-1

Notes:

SECTION 4. LOCATIONS

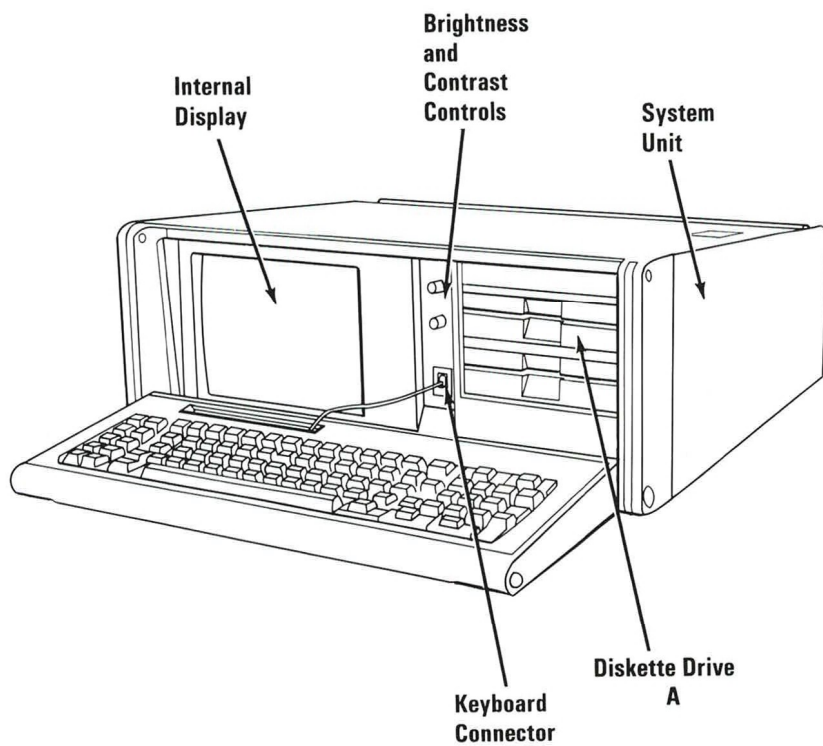
Contents

System Unit	4-3
System Unit (Front View)	4-3
System Unit (Rear View)	4-4
System Unit (Interior View)	4-5
System Unit (Bottom View)	4-6
System Board	4-7
Color/Graphics Monitor Adapter	4-9
Diskette Drive Adapter	4-9
 Keyboard	 4-10
U.S. English Keyboard	4-11
U.K. English Keyboard	4-12
Spanish Keyboard	4-13
French Keyboard	4-14
German Keyboard	4-15
Italian Keyboard	4-16
 Diskette Drive	 4-17
5-1/4" Slimline Diskette Drive	4-17
Diskette Drive (Bottom View)	4-18
 10 Megabyte Fixed Disk Drive	 4-19
Fixed Disk Drive (Top View)	4-19
Fixed Disk Drive (Bottom View)	4-20
 IBM Graphics Printer	 4-21
Graphics Printer (Rear View)	4-21
Graphics Printer Mechanism Assembly (Front View)	4-22
Graphics Printer Connectors (Rear View)	4-23
Graphics Printer Signal Cable	4-24

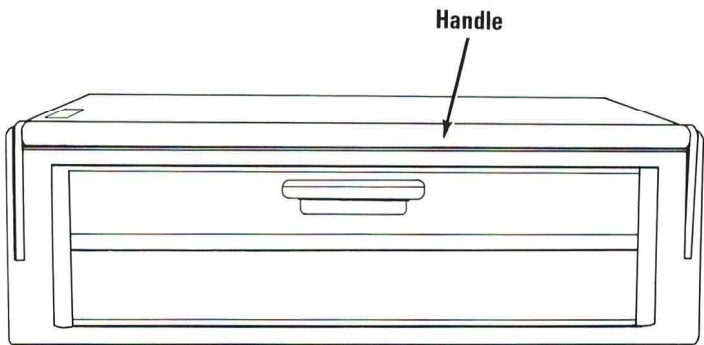
Graphics Printer (Top View)	4-25
Graphics Printer Head and Cable (Rear View)	4-26
Compact Printer	4-27
Expansion Unit	4-29
Expansion Unit (Rear View)	4-29
Expansion Unit (Top View)	4-30
Expansion Board	4-31
Extender Card	4-32
Receiver Card	4-32
Options and Option Adapters	4-33
Asynchronous Communications Adapter and Adapter	
Address Module	4-33
Communications Adapter Cable	4-34
Fixed Disk Adapter	4-34
Game Control Adapter	4-35
64/256KB Memory Expansion Option Adapter	4-35
Printer Adapter	4-36
Prototype Card	4-36
Binary Synchronous Communications Adapter and	
Adapter Address Jumper	4-37
Synchronous Data Link Control Communications	
Adapter	4-37
Cluster Adapter	4-38
Color Display	4-39
Option Locations	4-40
Input Voltage Selector Switch Location	4-41
Safety Ground Locations	4-42
System Unit	4-42
Expansion Unit Power Supply	4-43
IBM Graphics Printer	4-44
IBM Color Display	4-45
IBM Compact Printer	4-46
IBM Color Printer	4-47

System Unit

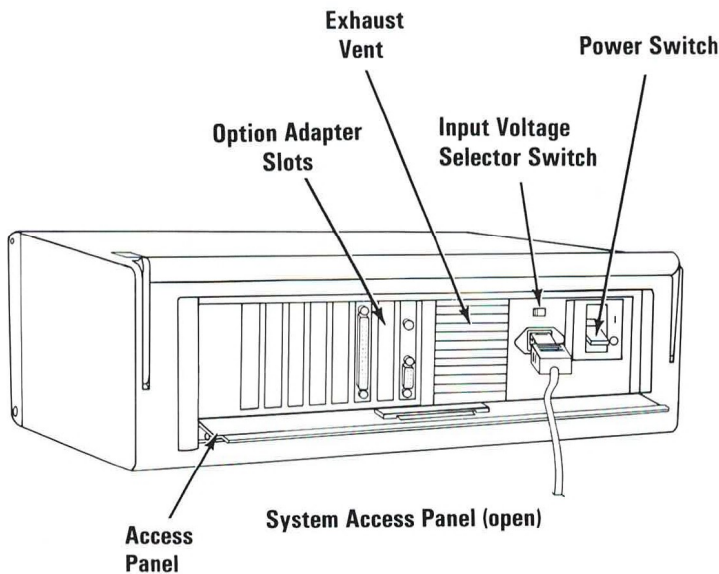
System Unit (Front View)



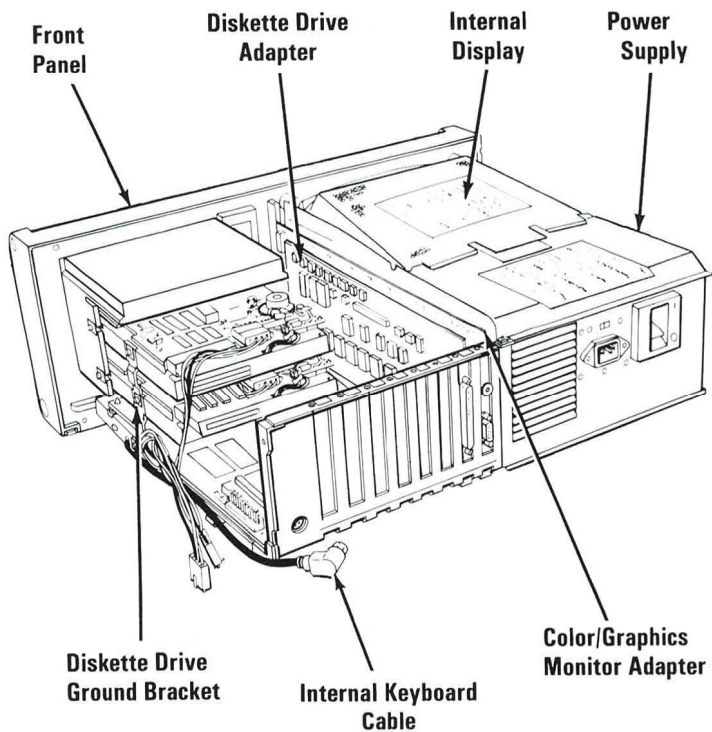
System Unit (Rear View)



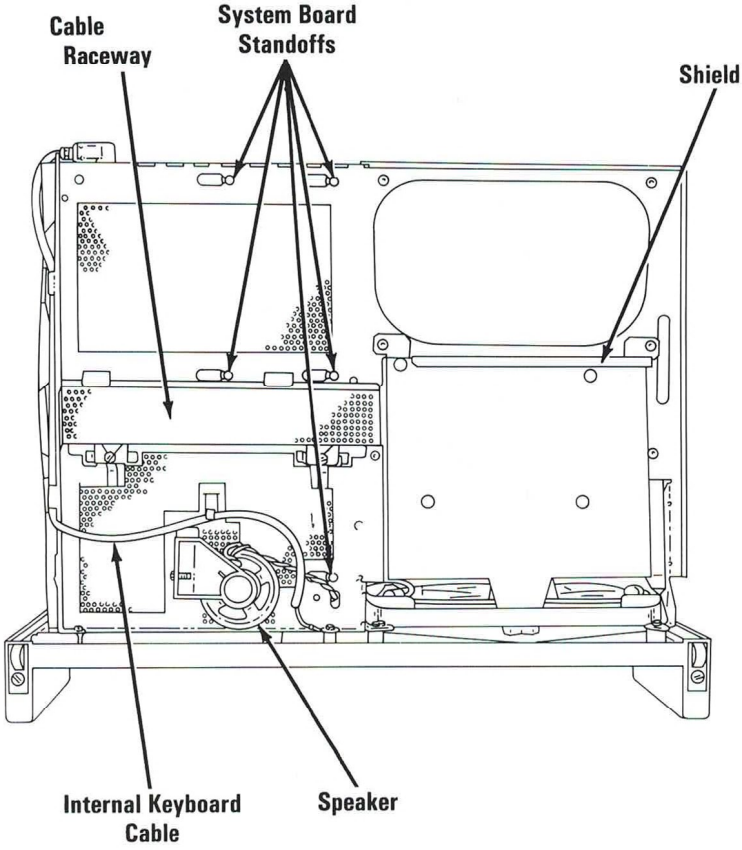
System Access Panel (closed)



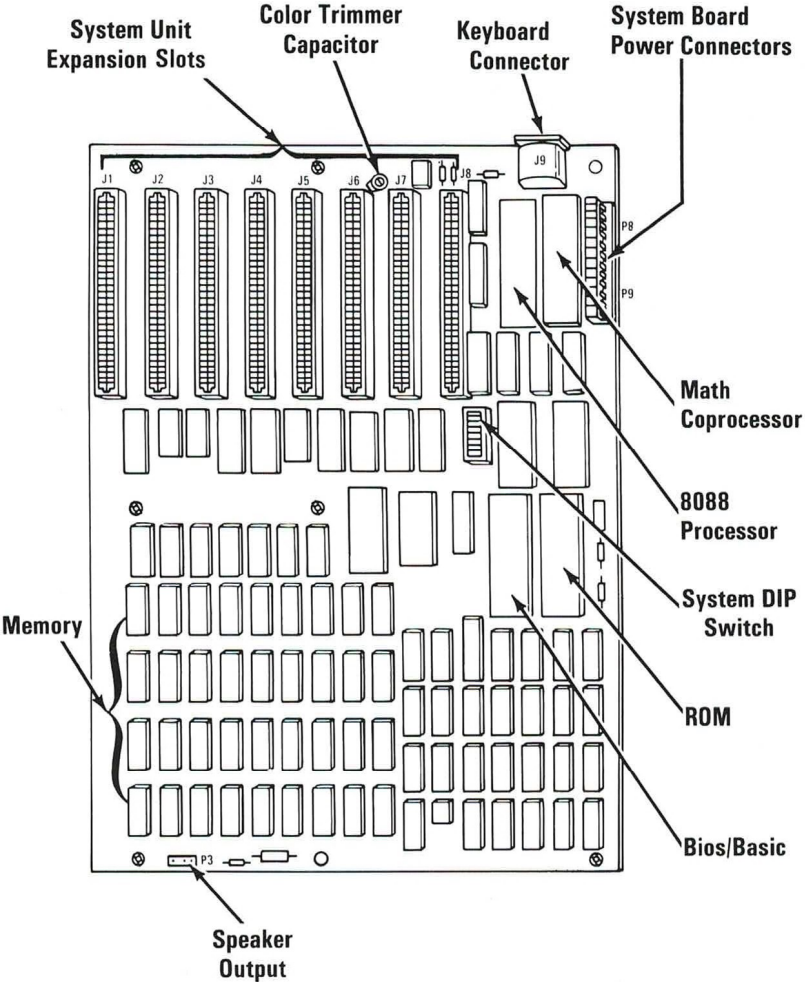
System Unit (Interior View)



System Unit (Bottom View)

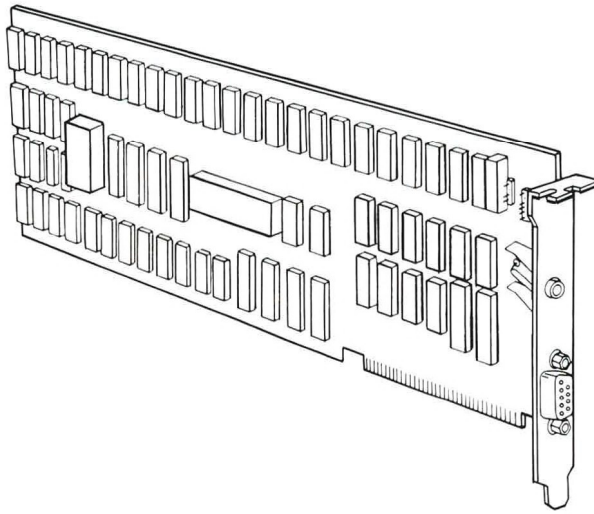


System Board

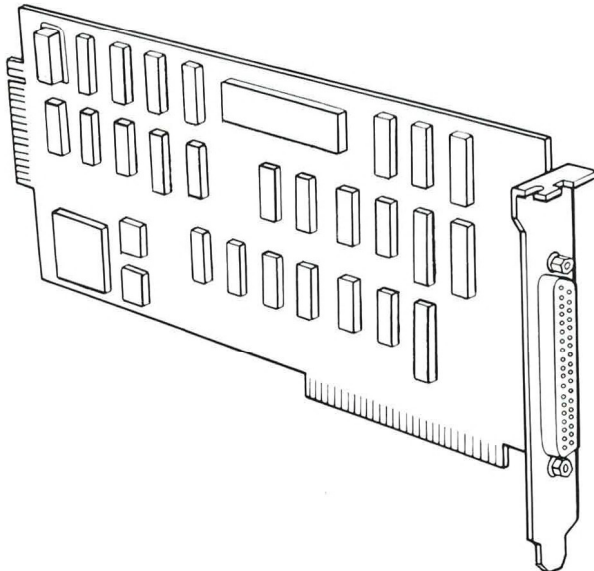


Notes:

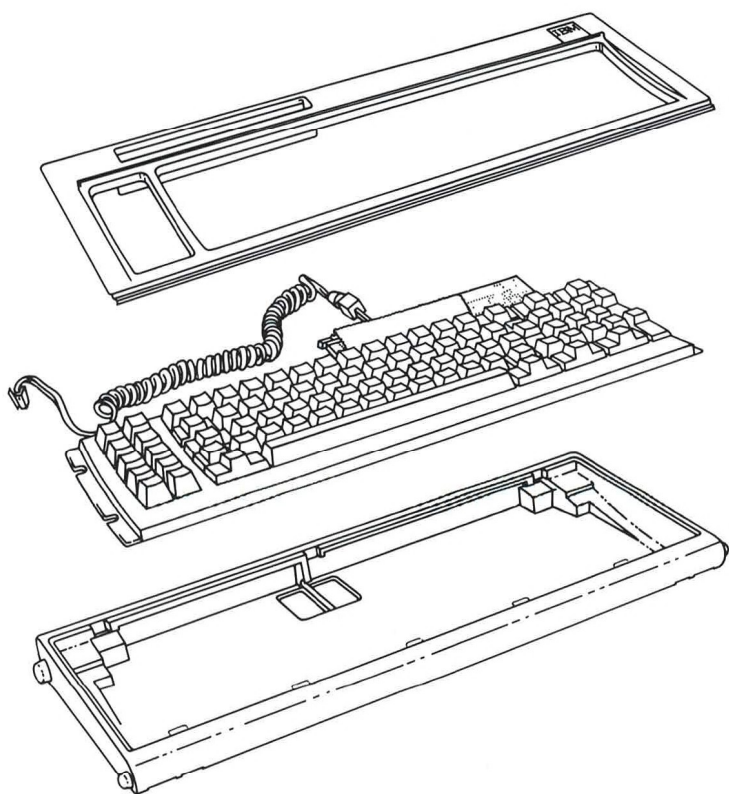
Color/Graphics Monitor Adapter



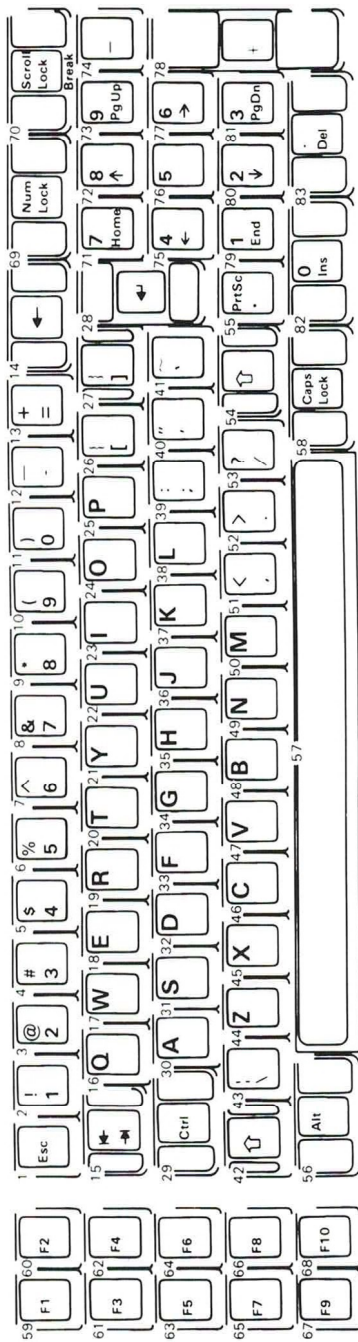
Diskette Drive Adapter



Keyboard

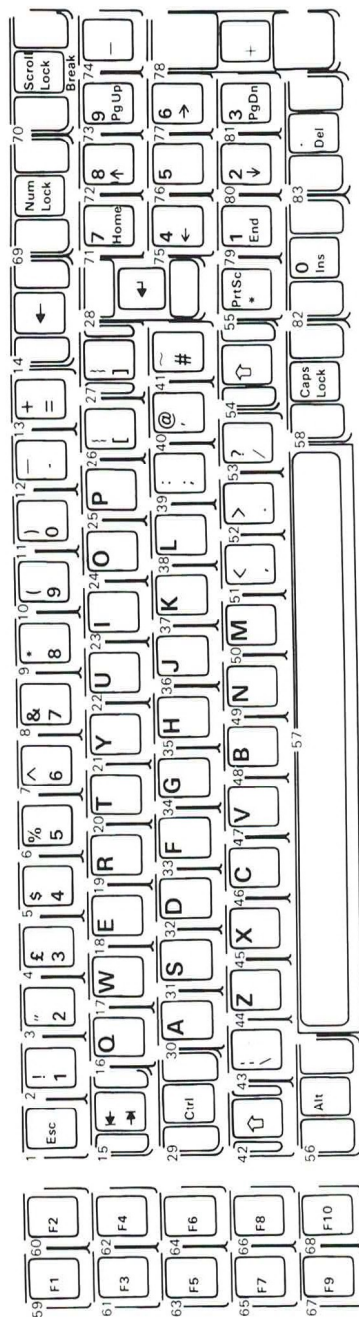


U.S. English Keyboard

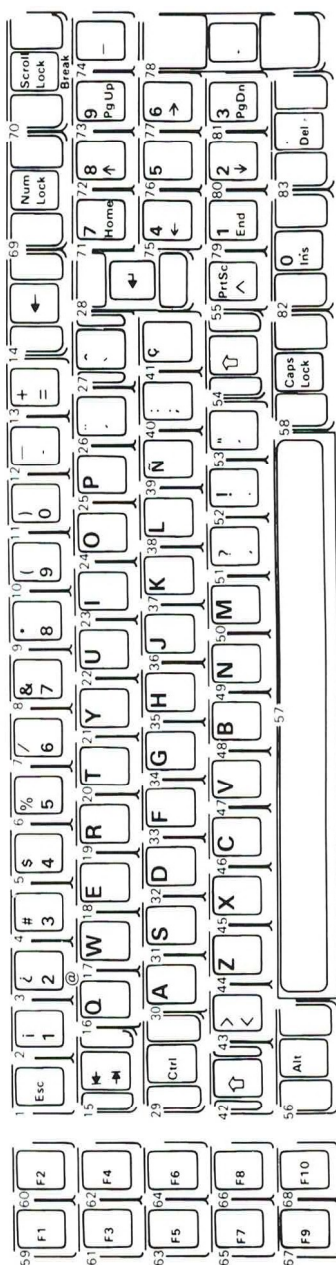


The Number To the Upper Left Designates the Key Position in the Parts Catalog (see Section 7)

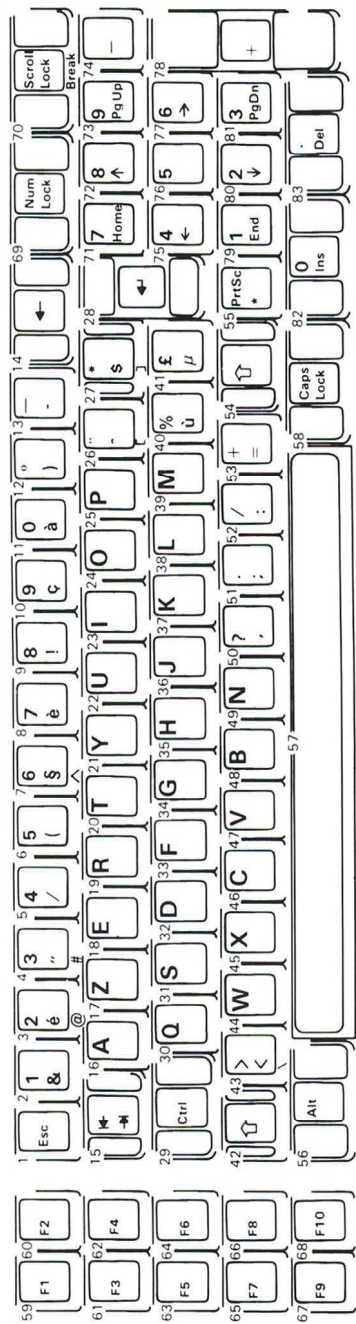
U.K. English Keyboard



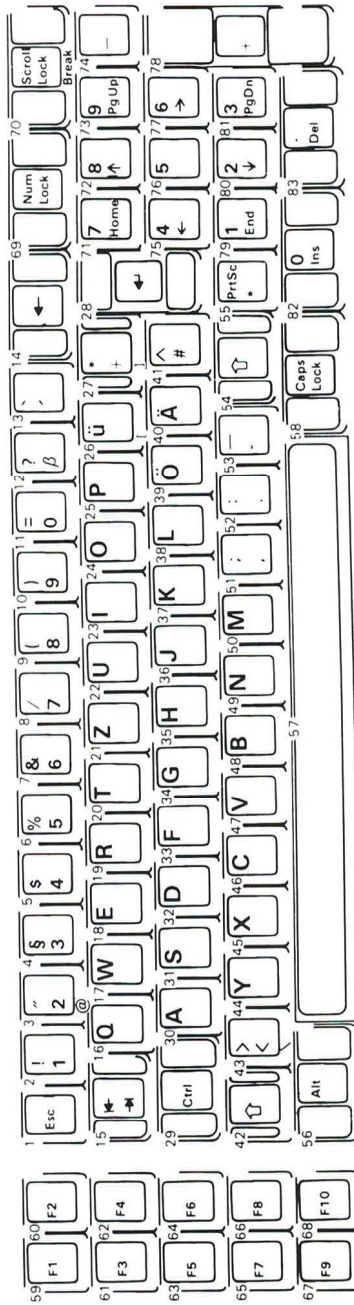
Spanish Keyboard



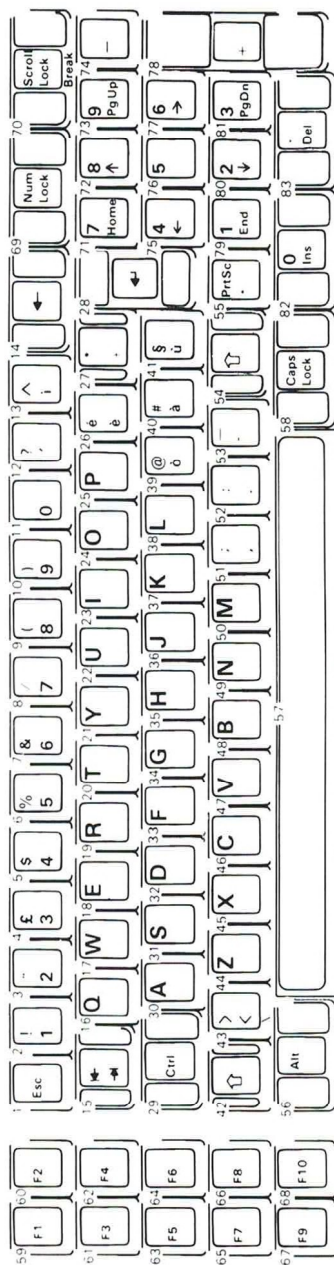
French Keyboard



German Keyboard

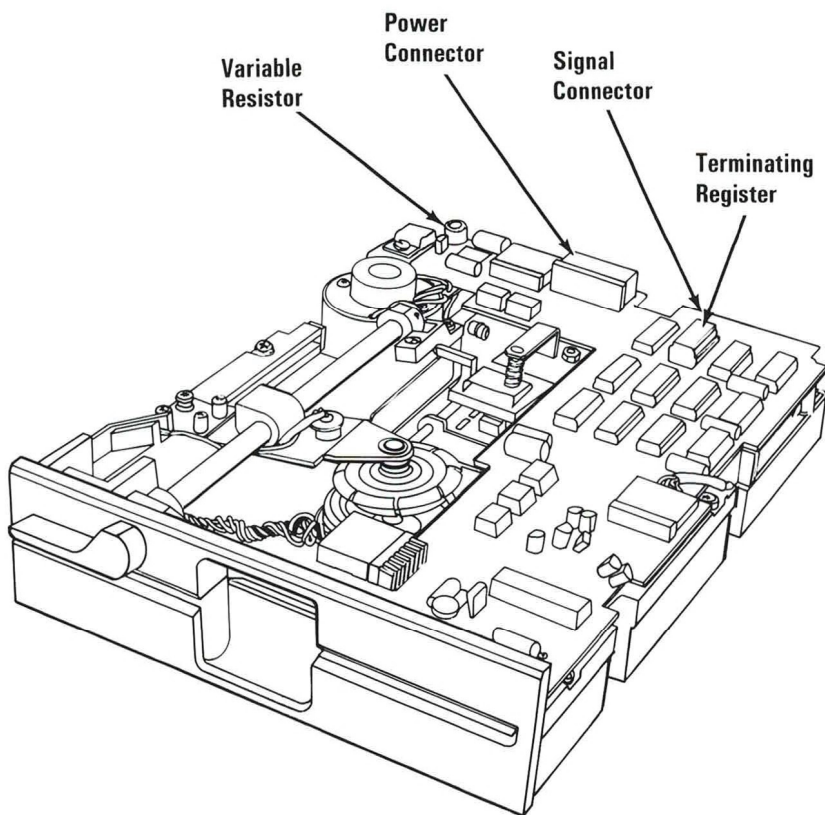


Italian Keyboard

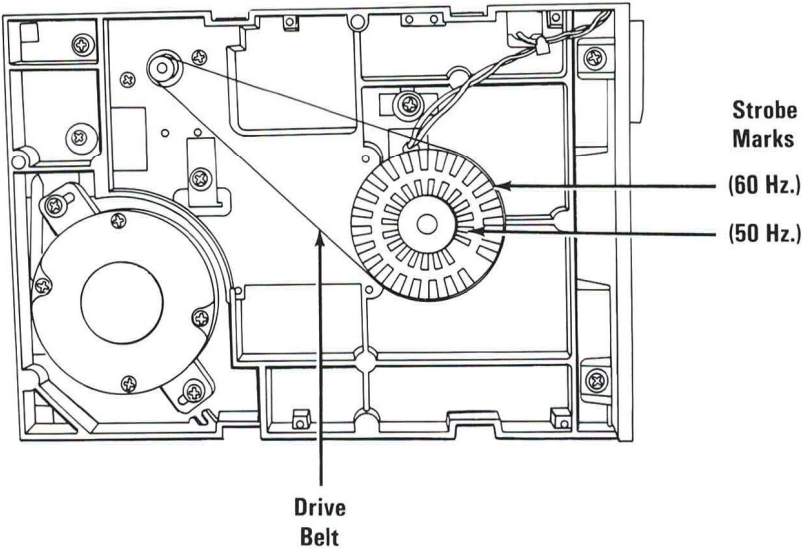


Diskette Drive

5-1/4" Slimline Diskette Drive

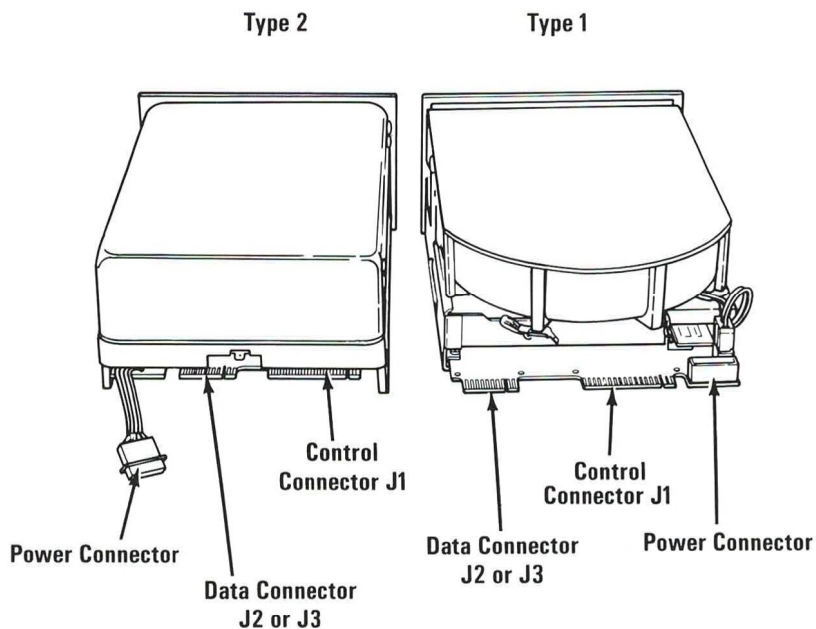


Diskette Drive (Bottom View)

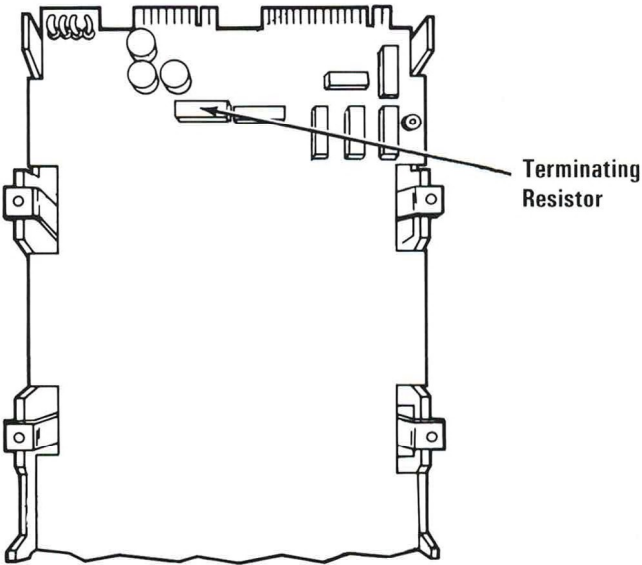
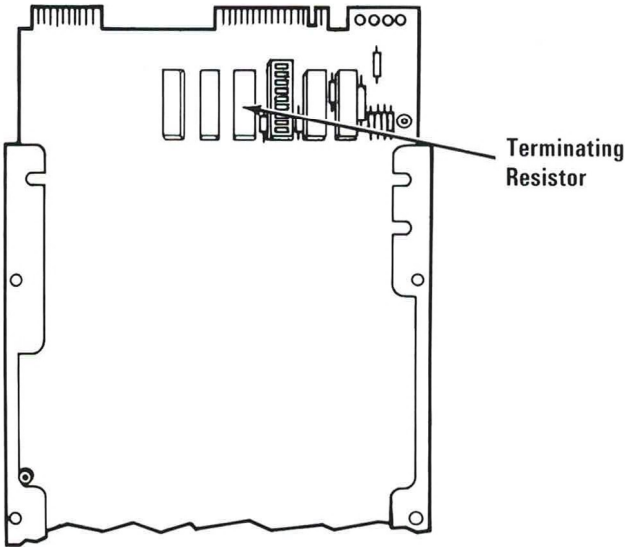


10 Megabyte Fixed Disk Drive

Fixed Disk Drive (Top View)

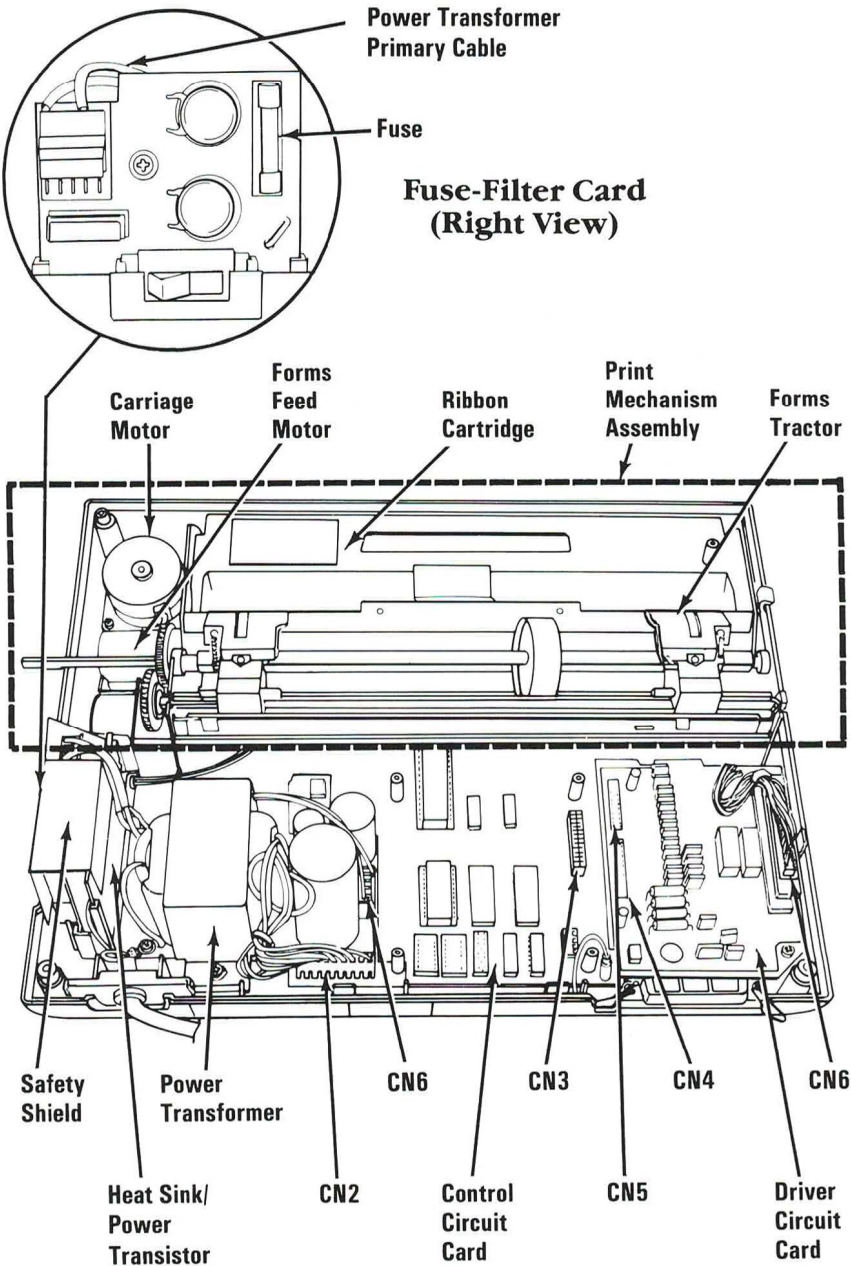


Fixed Disk Drive (Bottom View)

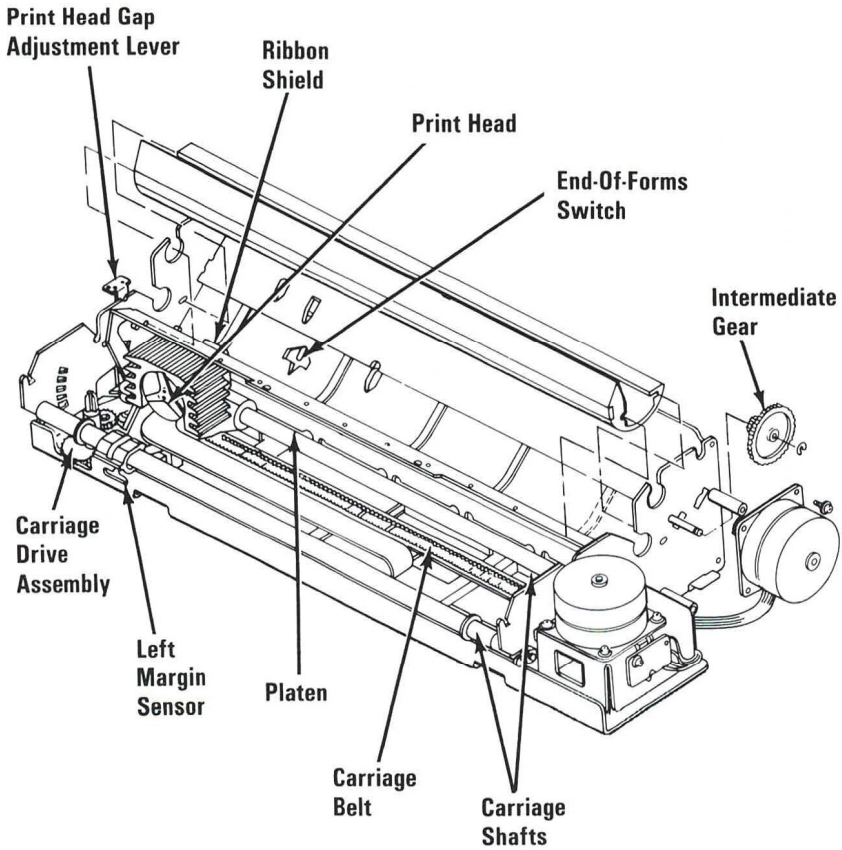


IBM Graphics Printer

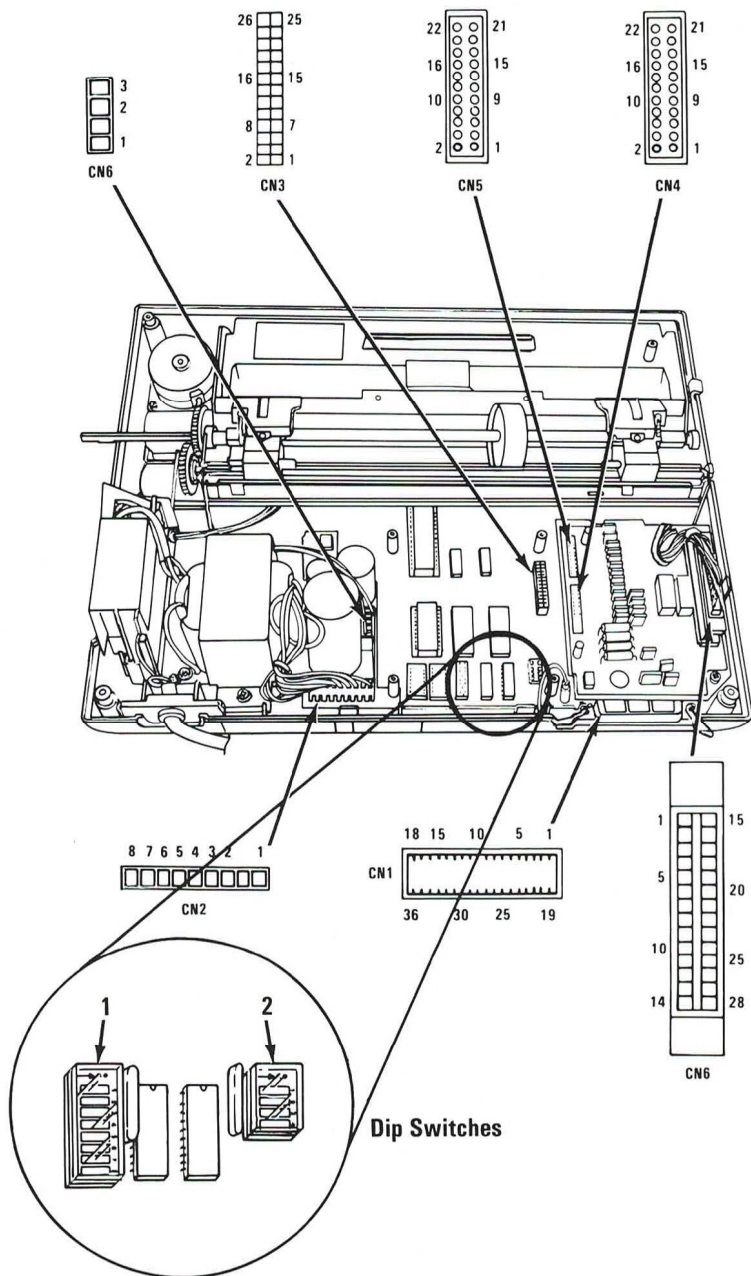
Graphics Printer (Rear View)



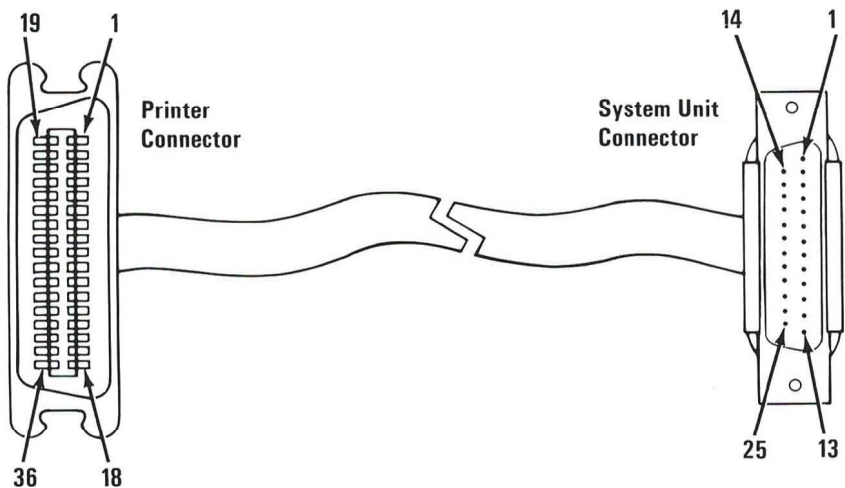
Graphics Printer Mechanism Assembly (Front View)



Graphics Printer Connectors (Rear View)

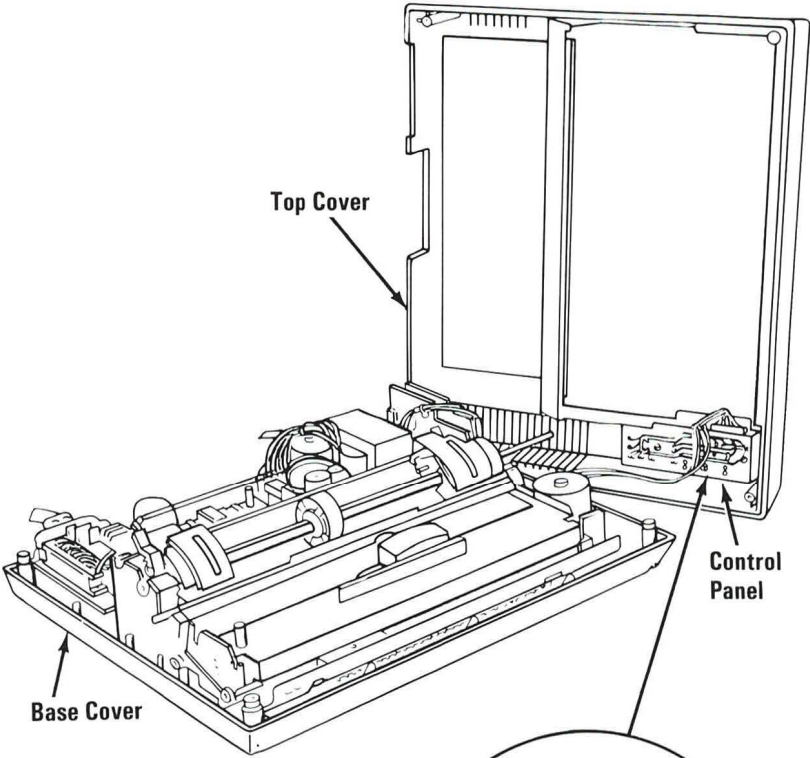


Graphics Printer Signal Cable

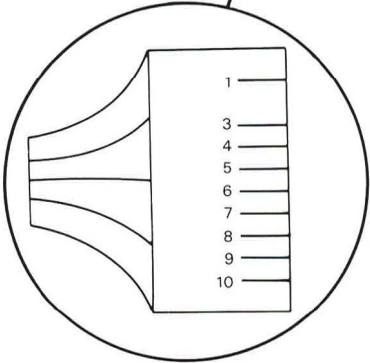


Printer Connector Pin Number	System Unit Connector Pin Number
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
32	15
31	16
36	17
33	18
19	19
21	20
23	21
25	22
27	23
29	24
30	25

Graphics Printer (Top View)



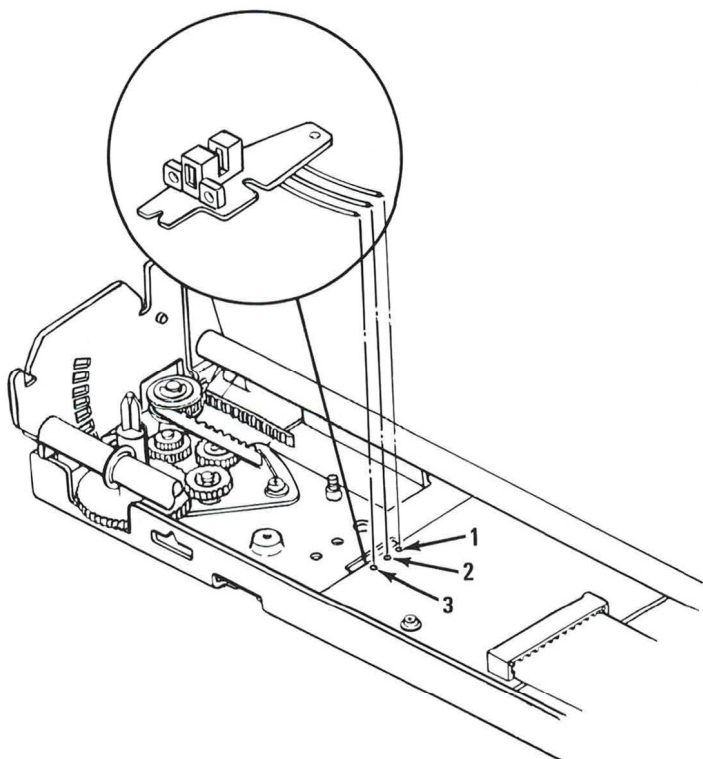
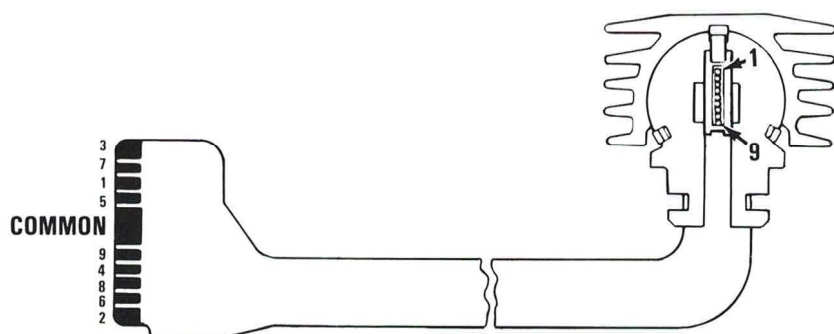
Printer (Top View)



Control Panel Connector

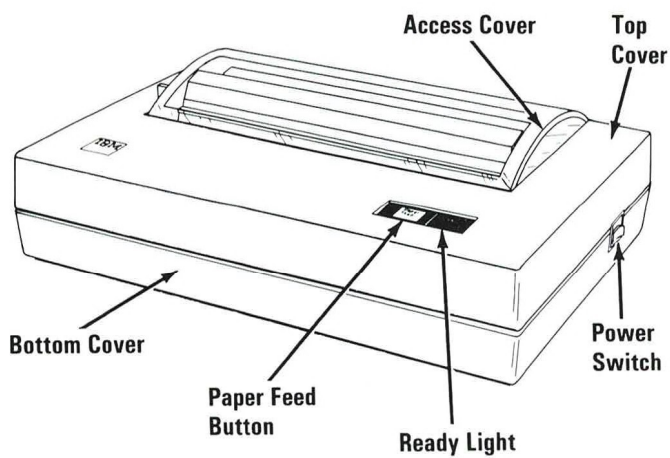
Pin	Name
1	Online Light
2	Key
3	No Paper Light
4	Ready Light
5	Online Switch
6	Forms Feed
7	Line Feed
8	Ground
9	+ 12 Vdc
10	Alarm

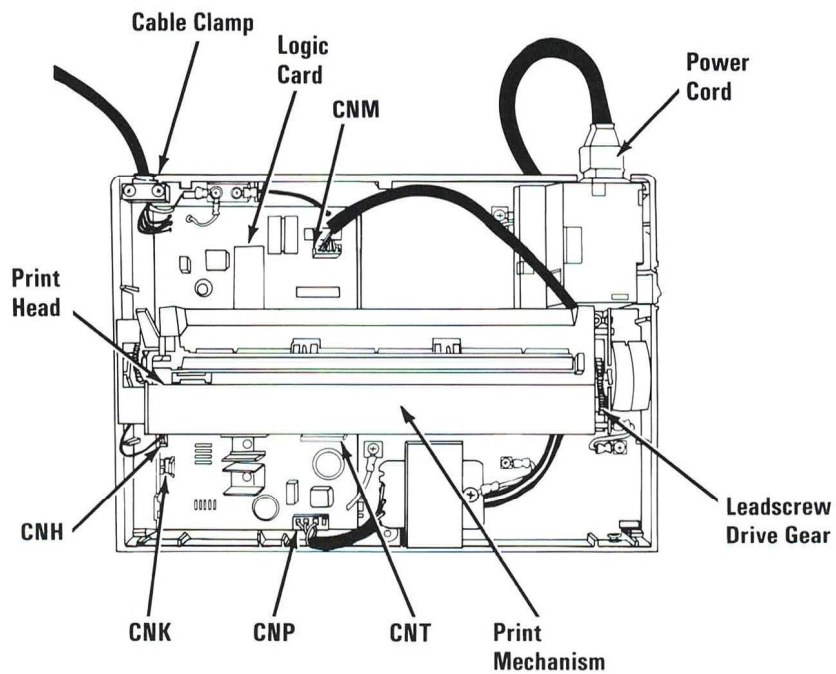
Graphics Printer Head and Cable (Rear View)



**Left Margin Sensor
(Front View)**

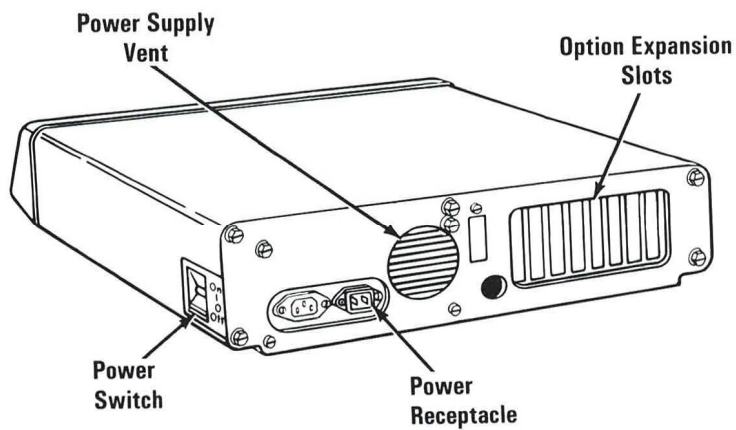
Compact Printer



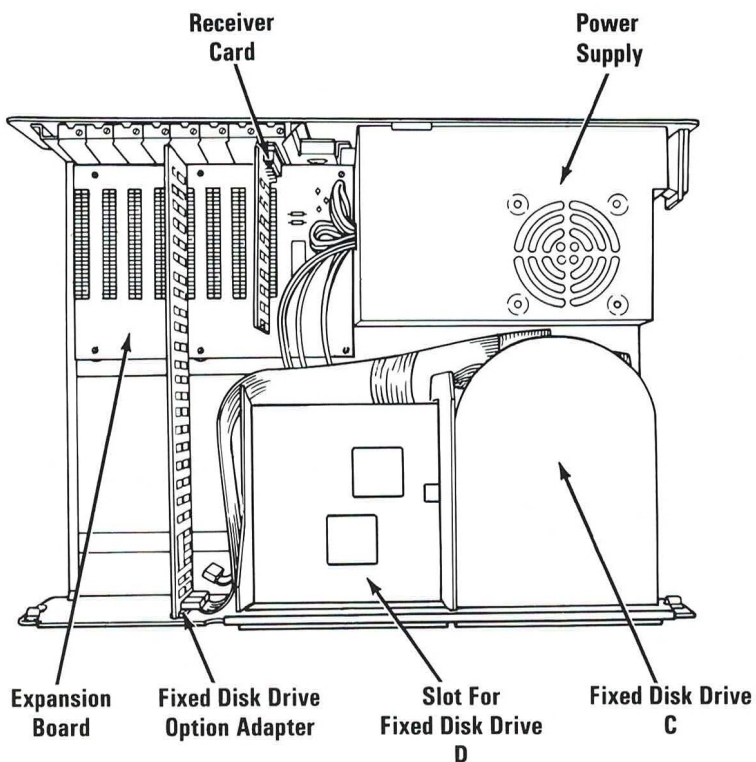


Expansion Unit

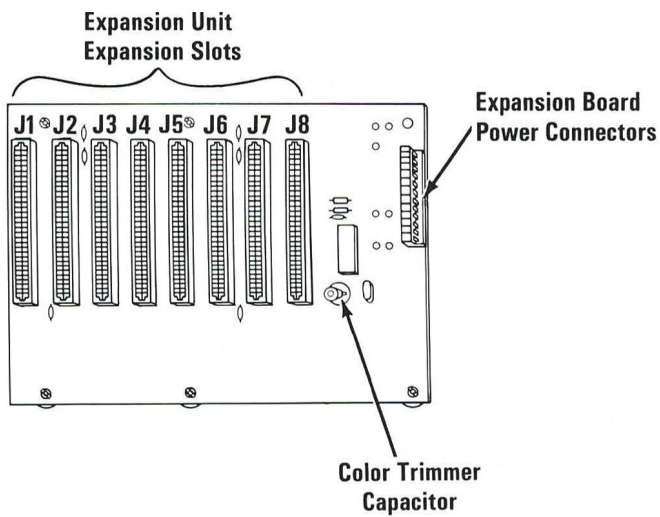
Expansion Unit (Rear View)



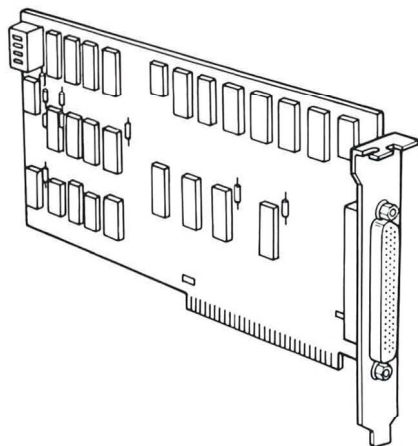
Expansion Unit (Top View)



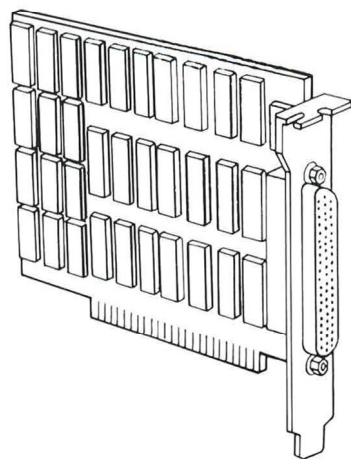
Expansion Board



Extender Card

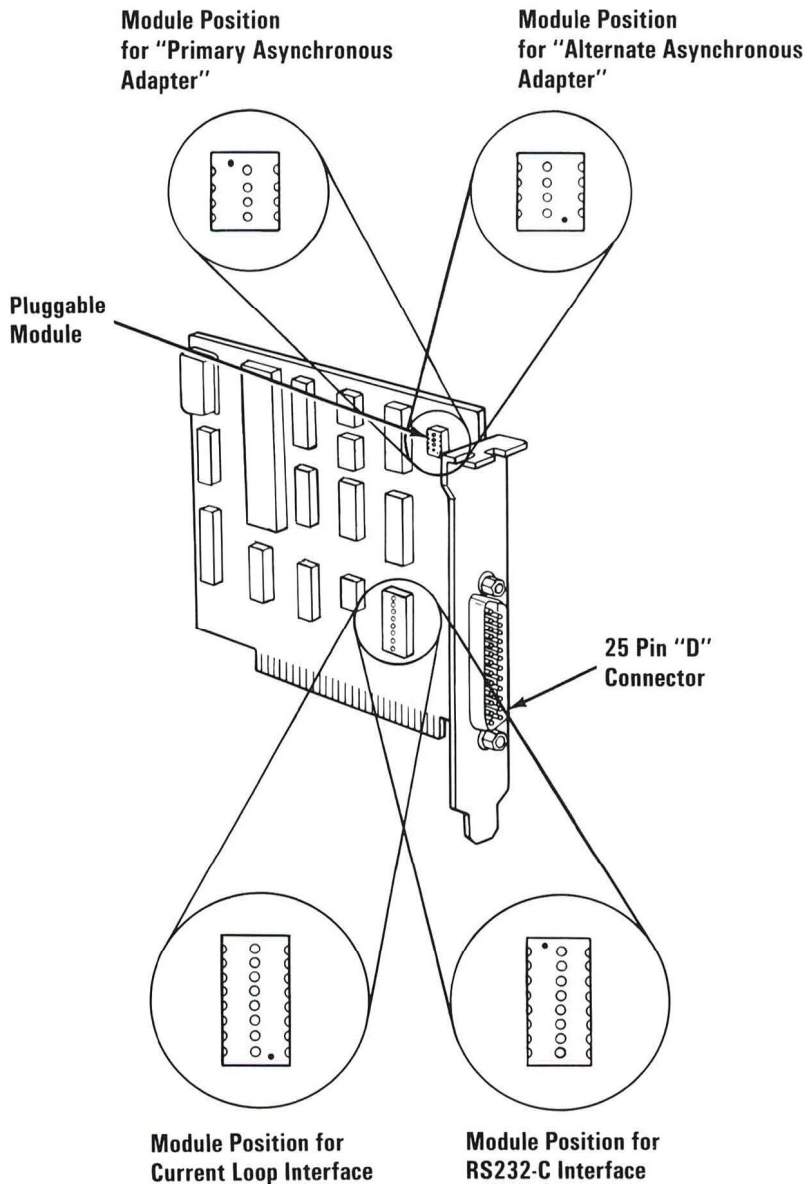


Receiver Card

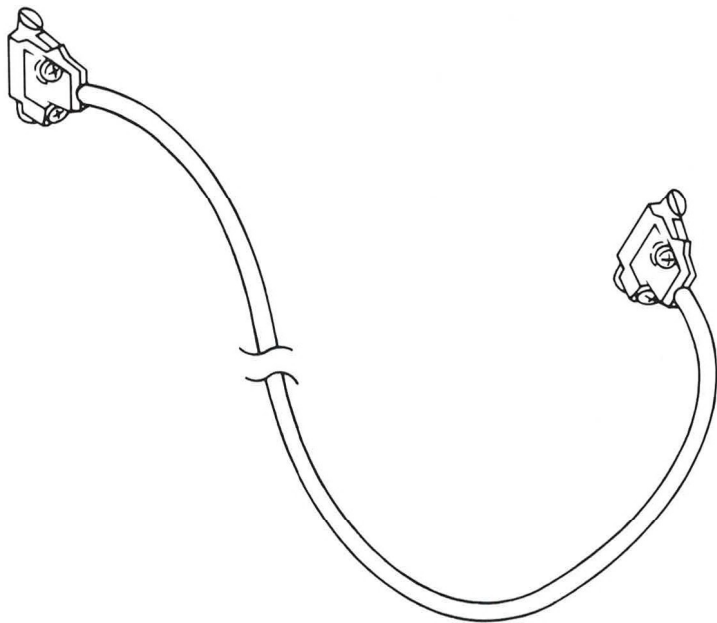


Options and Option Adapters

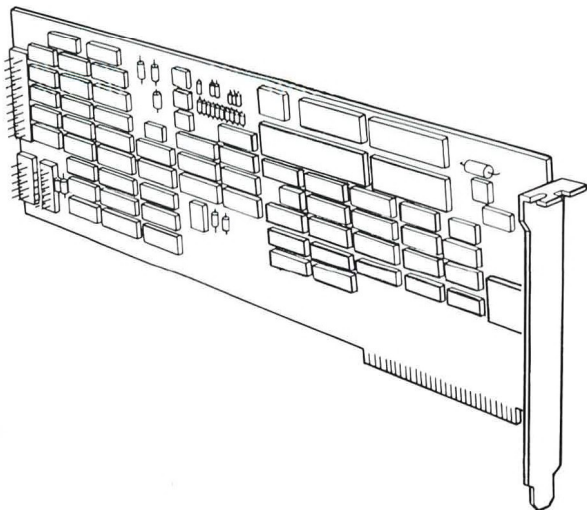
Asynchronous Communications Adapter and Adapter Address Module



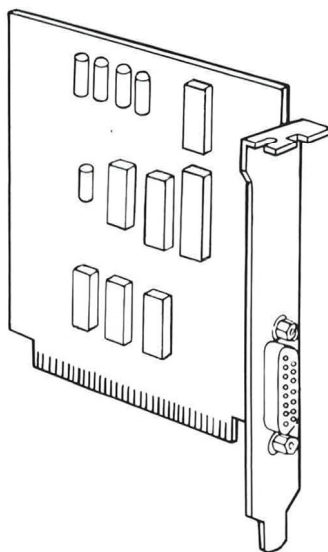
Communications Adapter Cable



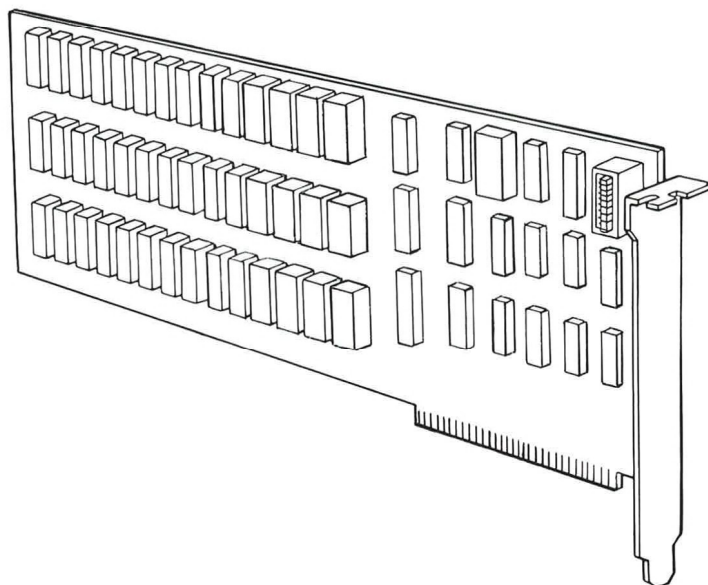
Fixed Disk Adapter



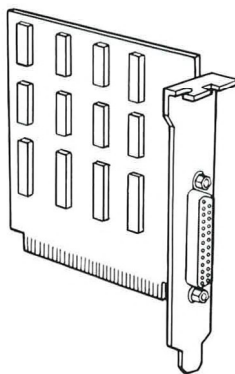
Game Control Adapter



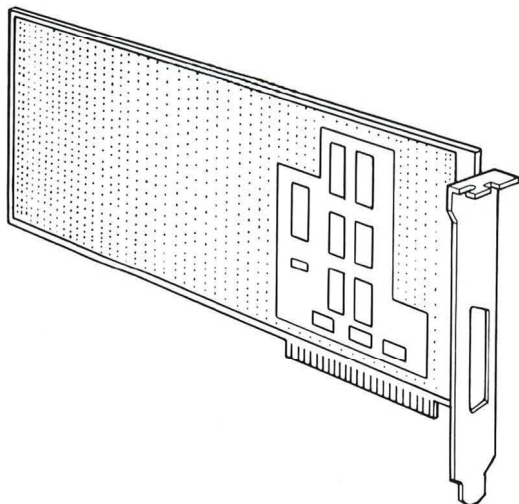
64/256KB Memory Expansion Option Adapter



Printer Adapter



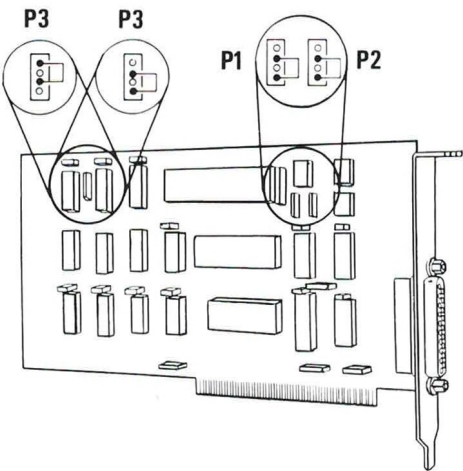
Prototype Card



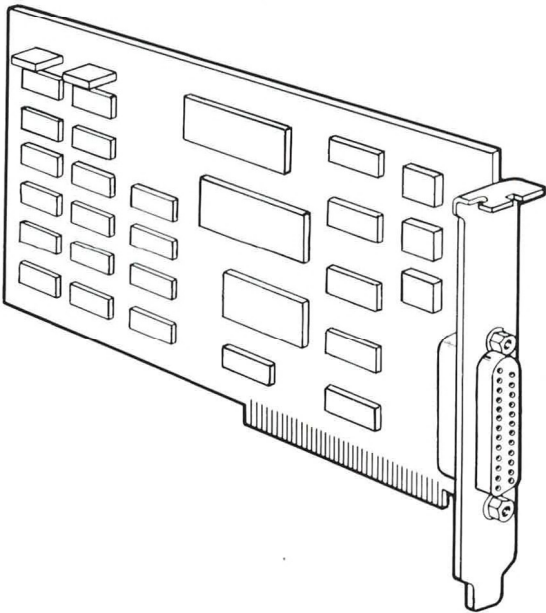
Binary Synchronous Communications Adapter and Adapter Address Jumper

**Jumper Position
for Primary BSC
Adapter**

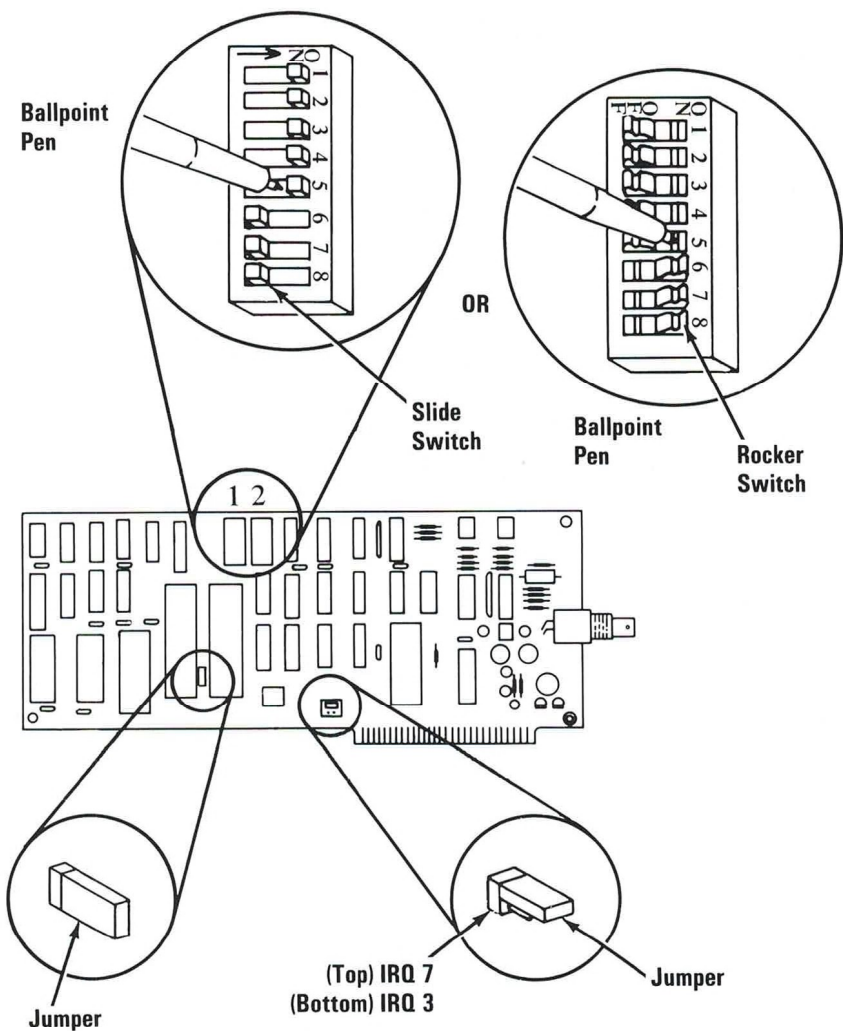
**Jumper Position
for Alternate BSC
Adapter**



Synchronous Data Link Control Communications Adapter

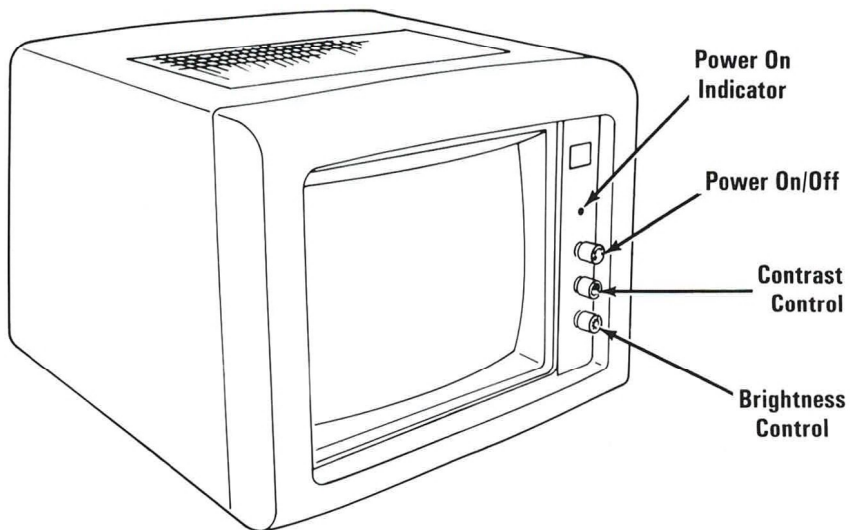


Cluster Adapter



NOTE: Set a rocker switch by pressing the rocker down to the desired position.

Color Display



Option Locations

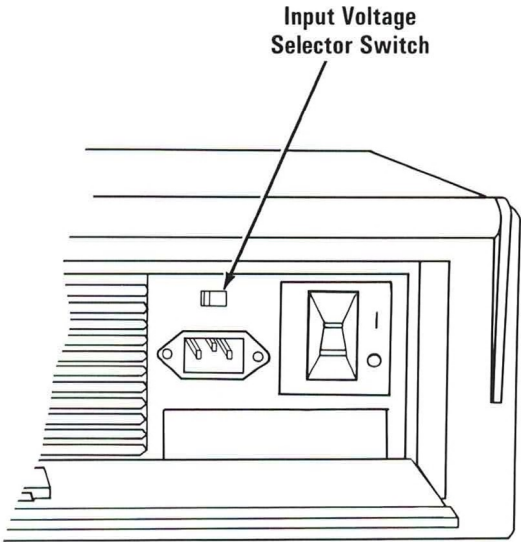
Color/Graphics Monitor Adapter	These are the
Diskette Drive Adapter	standard adapters
	in the system
	unit.

Asynchronous Communications Adapter	These options may
Alternate Asynchronous Communications	appear as options
Adapter	in the system
Printer Adapter	unit.
64/256KB Memory Expansion Option	
Game Control Adapter	
Prototype Card	
Extender Card	
Binary Synchronous Communication Adapter .	
Alternate Binary Synchronous Communication	
Adapter	
SDLC Communications Adapter	
Cluster Adapter	

Game Control Adapter	These options
Fixed Disk Adapter	may be installed
Fixed Disk Drive	in the expansion
Prototype Card	unit.
Asynchronous Communications Adapter	
Alternate Asynchronous Communications	
Adapter	
Binary Synchronous Communications	
Alternate Binary Synchronous Communication	
Adapter	
SDLC Communications Adapter	
Receiver Card	
Cluster Adapter	
Printer Adapter	

IBM Math Coprocessor Option	System unit
	feature.

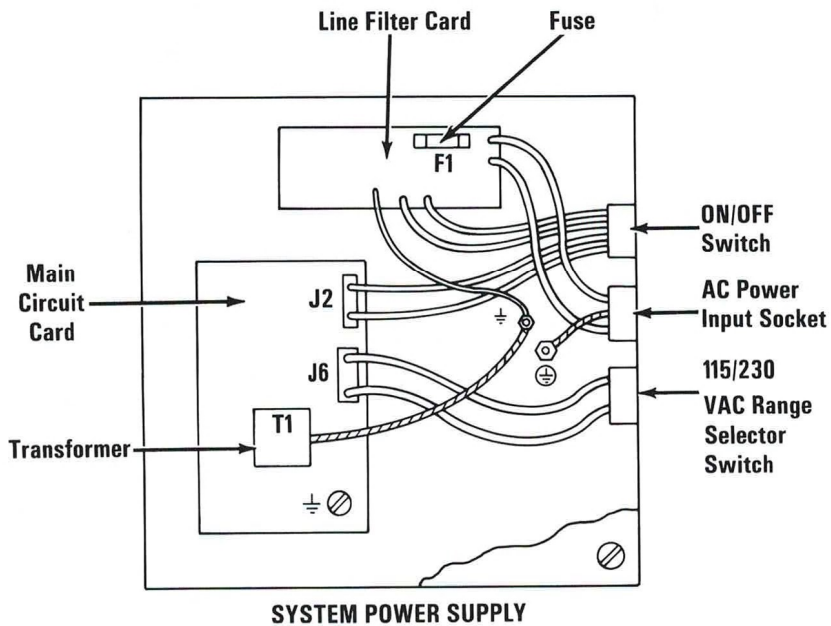
Input Voltage Selector Switch Location



Switch Position	Vac Voltage Range
115	100 to 125
230	200 to 240

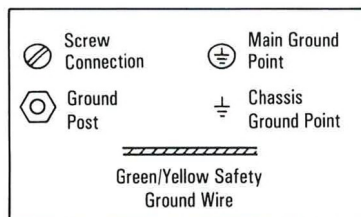
Safety Ground Locations

System Unit

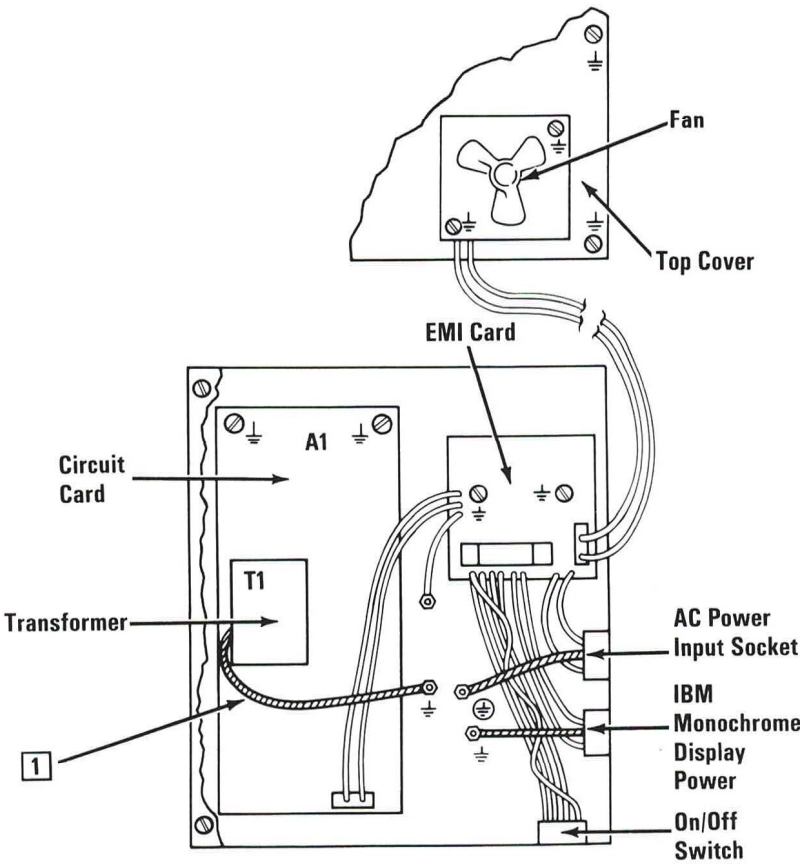


IBM Portable Personal Computer

Legend









Expansion Unit Power Supply

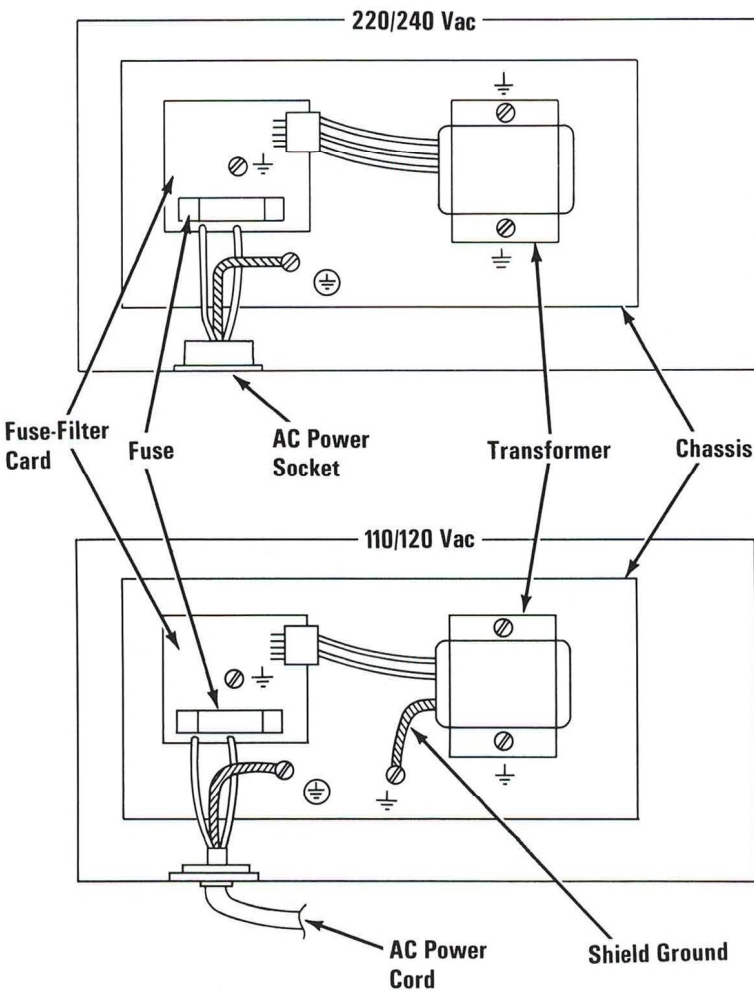


Expansion Unit Power Supply

Legend





 Screw Connection	 Primary Ground	 Ground Wire
 Ground Post	 Chassis Ground	 Note: This lead present on 220/240 Vac machines only.

IBM Graphics Printer

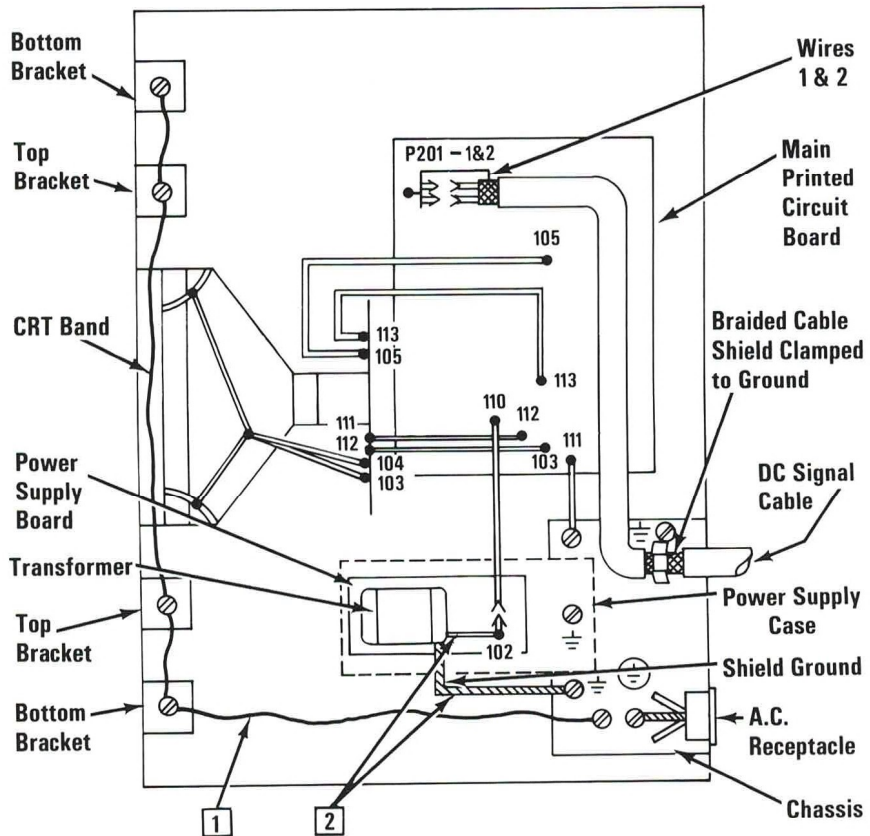


IBM Graphics Printer

Legend







 Screw Connection	 Primary Ground
 Ground Lead	 Chassis Ground

IBM Color Display



IBM Color Display

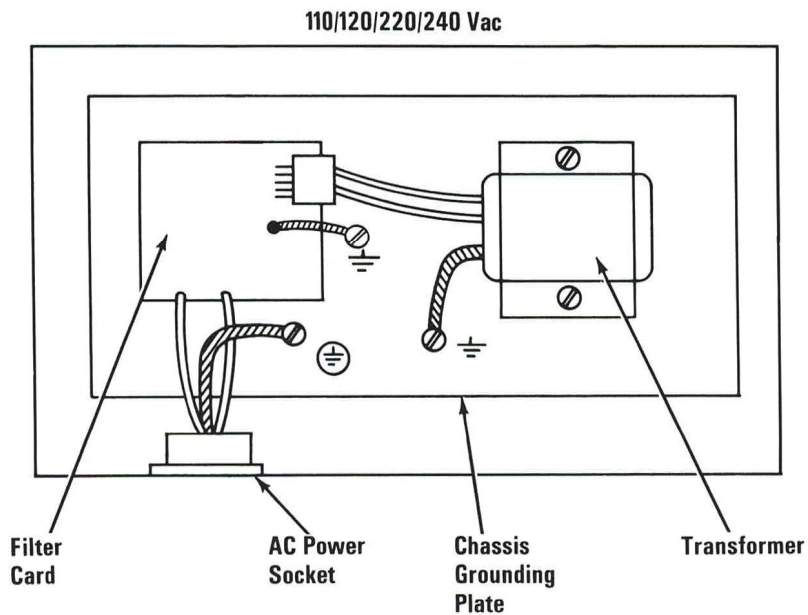
Legend

	Screw Connection		Ground Lead
	Soldered Connection		Primary Ground
	Plugged Connection		Chassis Ground

Note: Points 103, 105, 110, 111, 112, 113, and P201-1&2 on main board are joined by printed circuit lands.





- 1** Not present on U.S. only displays
- 2** Present only on model-002 displays

IBM Compact Printer

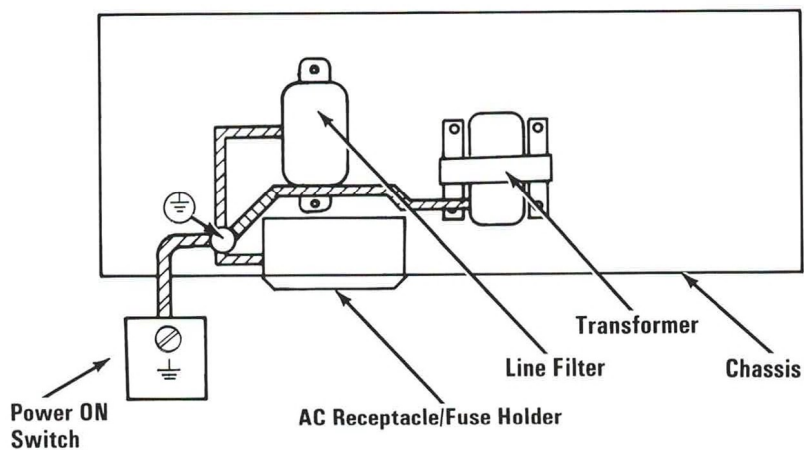
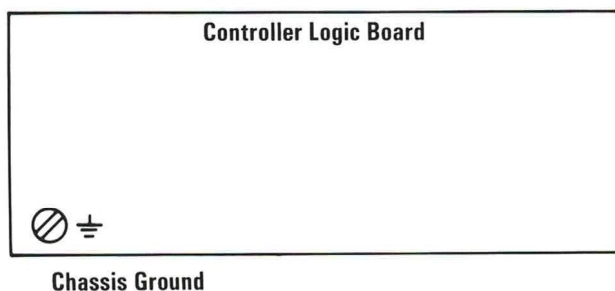
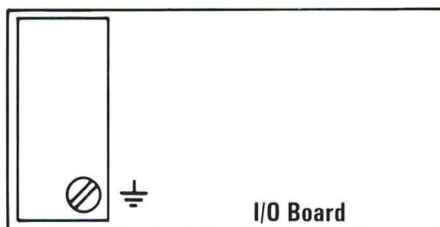


IBM PC Compact Printer

Legend





	Screw Connection		Primary Ground
	Ground Lead		Chassis Ground

IBM Color Printer

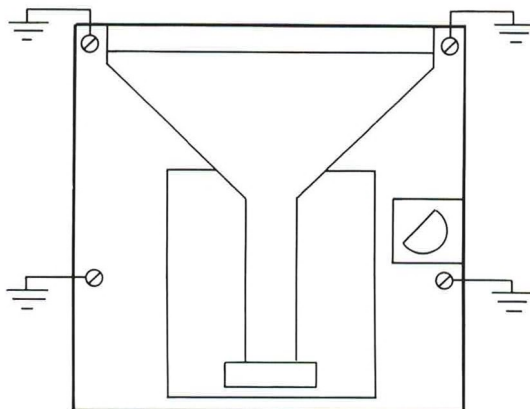


IBM Color Printer

Legend





	Screw Connection
	Ground Lead
	Primary Ground
	Chassis Ground

Internal Display



IBM Portable Personal Computer Internal Display

Legend

 Screw Connection	 Primary Ground
 Ground Lead	 Chassis Ground

SECTION 5. REMOVAL/ REPLACEMENT AND ADJUSTMENTS

Contents

System Unit	5-6
Cover Removal 1005	5-6
Cover Replacement 1006	5-8
Front Panel Removal 1010	5-9
Front Panel Replacement 1011	5-11
 Power Supply	 5-14
Power Supply Removal 1015	5-14
Power Supply Replacement 1016	5-17
Power Supply Fan Removal 1020	5-19
Power Supply Fan Replacement 1021	5-20
 System Board	 5-21
System Board Removal 1025	5-21
System Board Replacement 1026	5-23
64KB Memory Module Removal 1030	5-25
64KB Memory Module Replacement 1031	5-27
Math Coprocessor Removal 1035	5-28
Math Coprocessor Replacement 1036	5-30
8088 Processor Removal 1040	5-35
8088 Processor Replacement 1041	5-37
Speaker Removal 1045	5-39
Speaker Replacement 1046	5-40
 Keyboard	 5-41
Keyboard Removal 1050	5-41
Keyboard Replacement 1051	5-42

Keyboard Cover Removal 1055	5-43
Keyboard Assembly Removal 1060	5-44
Keyboard Assembly Replacement 1061	5-45
Internal Keyboard Cable Removal 1062	5-46
Internal Keyboard Cable Replacement 1063	5-48
Displays	5-50
Internal Display Removal 1065	5-50
Internal Display Replacement 1066	5-55
IBM Color Display Removal 1070	5-61
IBM Color Display Replacement 1071	5-62
Color Trimmer Capacitor Adjustment	5-63
Vertical Hold Adjustment	5-64
Vertical Size Adjustment	5-65
Diskette Drive	5-66
Diskette Drive Removal 1075	5-66
Diskette Drive Replacement 1076	5-71
Drive Belt Removal 1080	5-74
Drive Belt Replacement 1081	5-74
Drive-Motor Preliminary Speed Adjustment	5-75
Drive Motor Speed Adjustment	5-79
Option Adapters	5-83
Color/Graphics Monitor Adapter Removal 1085	5-83
Color/Graphics Monitor Adapter Replacement 1086 ..	5-85
Diskette Drive Adapter Removal 1090	5-87
Diskette Drive Adapter Replacement 1091	5-88
Option Adapter Removal 1095	5-90
Option Adapter Replacement 1096	5-92
Fixed Disk Drive	5-93
Drive C Removal 2000	5-93
Drive C Replacement 2001	5-96
Drive D Removal 2005	5-100
Drive D Replacement 2006	5-103
Expansion Unit	5-107
Expansion Board Removal 2010	5-107

Expansion Board Replacement 2011	5-109
Expansion Unit Cover Removal 2015	5-111
Expansion Unit Cover Replacement 2016	5-112
Expansion Unit Power Supply Removal 2020	5-113
Expansion Unit Power Supply Replacement 2021	5-119
Expansion Unit Option Adapters	5-120
Option Adapter Removal 2025	5-120
Option Adapter Replacement 2026	5-121
Fixed Disk Adapter Removal 2030	5-122
Fixed Disk Drive Adapter Replacement 2031	5-124
IBM Graphics Printer	5-127
Carriage Belt Adjustment	5-127
Carriage Belt Removal 2100	5-130
Carriage Belt Replacement 2105	5-133
Carriage Drive Assembly Removal 2110	5-135
Carriage Drive Assembly Replacement 2115	5-137
Control Circuit Card Removal 2120	5-140
Printer Dip Switch Chart	5-144
Control Circuit Card Replacement 2125	5-146
Driver Circuit Card Removal 2130	5-149
Driver Circuit Card Replacement 2135	5-151
Control Panel Removal 2140	5-152
Control Panel Replacement 2145	5-153
Access Cover Removal 2150	5-154
Top Cover Removal 2155	5-155
Top Cover Replacement 2160	5-158
Base Cover Removal 2165	5-161
Base Cover Replacement 2170	5-162
Forms Feed Knob Removal 2175	5-163
Forms Rack Removal 2180	5-164
Forms Tractor Removal 2185	5-165
Forms Tractor Replacement 2190	5-167
Fuse Removal 2195	5-168
Fuse-Filter Card Removal-220/240 Volt 2200	5-169
Fuse-Filter Card Replacement-220/240 Volt 2205	5-171
Fuse-Filter Card/Power Cord Removal-120 Volt 2210	5-173

Fuse-Filter Card/Power Cord Replacement--120 Volt	
2215	5-175
Heat Sink/Power Transistor Assembly Removal	
2220	5-177
Heat Sink/Power Transistor Assembly Replacement	
2225	5-178
Intermediate Gear Removal 2230	5-179
Intermediate Gear Replacement 2235	5-181
Left Margin Sensor Adjustment	5-183
Left-Margin Sensor Removal 2240	5-190
Left-Margin Sensor Replacement 2245	5-192
Power Transformer Removal--220/240 Volt 2250	5-194
Power Transformer, 220/240-Volt, Primary Power	
Connector Wiring Check	5-196
Power Transformer Replacement--220/240 Volt	
2255	5-197
Power Transformer Removal--120 Volt 2260 ...	5-198
Power Transformer Replacement--120 Volt 2265 .	5-200
Print Head Removal 2270	5-201
Print Head Replacement 2275	5-203
Print Head Gap Adjustment 2280	5-205
Print Mechanism Assembly Removal 2285	5-206
Print Mechanism Assembly Replacement 2290 ...	5-208
Ribbon Shield Removal 2295	5-211
Ribbon Shield Replacement 2300	5-212
Safety Shield Removal 2305	5-214
Compact Printer	5-215
Top Cover Removal 6000	5-215
Top Cover Replacement 6005	5-218
Print Mechanism Removal 6010	5-219
Print Mechanism Replacement 6015	5-220
Logic Card Removal 6020	5-222
Logic Card Replacement 6025	5-224

This section contains the removal, replacement, and adjustment procedures for the field replaceable units (FRUs) in the IBM Portable Personal Computer system. Each procedure is assigned a reference number, which is to the right of the procedure title. (Reference numbers are also listed in the Contents.) A reference number in parentheses at the end of a procedural step means the instructions for performing that step are described under that reference number and you should perform the referenced procedure before continuing.

The following example shows the use of reference numbers.

1. Set the system unit's Power switch to Off.
2. Remove the system unit's cover. (1005)
3. Disconnect the speaker connector.
4. Remove the speaker mounting screw.

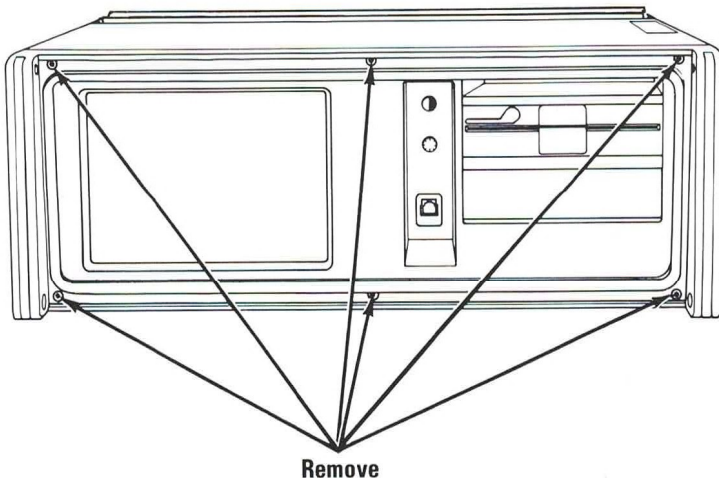
In Step 2 of the example, the instructions for removing the system unit's cover are in procedure 1005. Perform procedure 1005 before continuing with Step 3.

System Unit

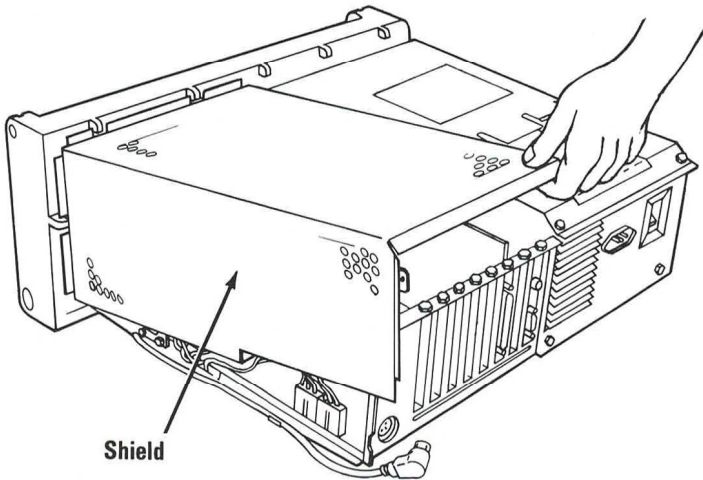
Cover Removal 1005

1. Set the Power switch on the system unit (and expansion unit, if attached) to Off.
2. Unplug the system unit's (and expansion unit's) power cords from the wall outlet.
3. Disconnect all cables from the rear of the system unit.
4. Move the keyboard and all external options away from the system unit.
5. Place the system unit in its operating position so the front panel faces you.
6. Remove the six cover mounting screws from the front panel (as shown).

Warning: The system unit's cover is now loose. Be careful when picking up the system unit by its cover.



7. Place the system unit on its front panel, in an upright position, and slide the cover off.
8. Return the system unit to its operating position.
9. Find the system-unit shield and remove the screw on the right side of the frame, the one on the back, and the one on top.
10. Remove the shield.

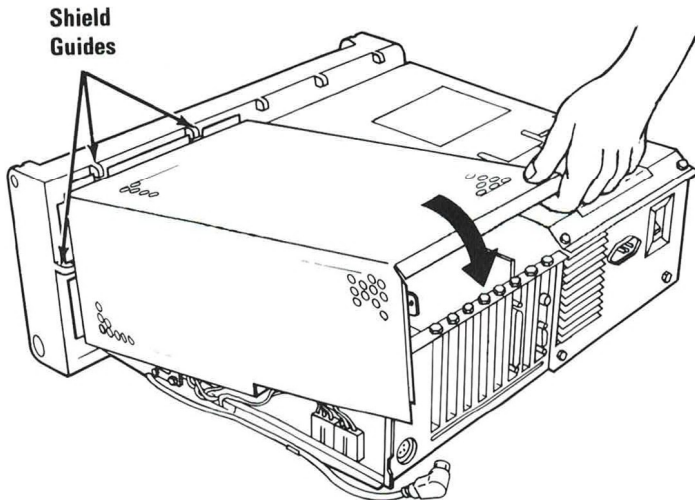


Cover Replacement 1006

1. Install the system-unit shield.
2. Install the screw on the back, the top, and the right side of the system unit and tighten them.
3. Slide the cover down over the system unit.

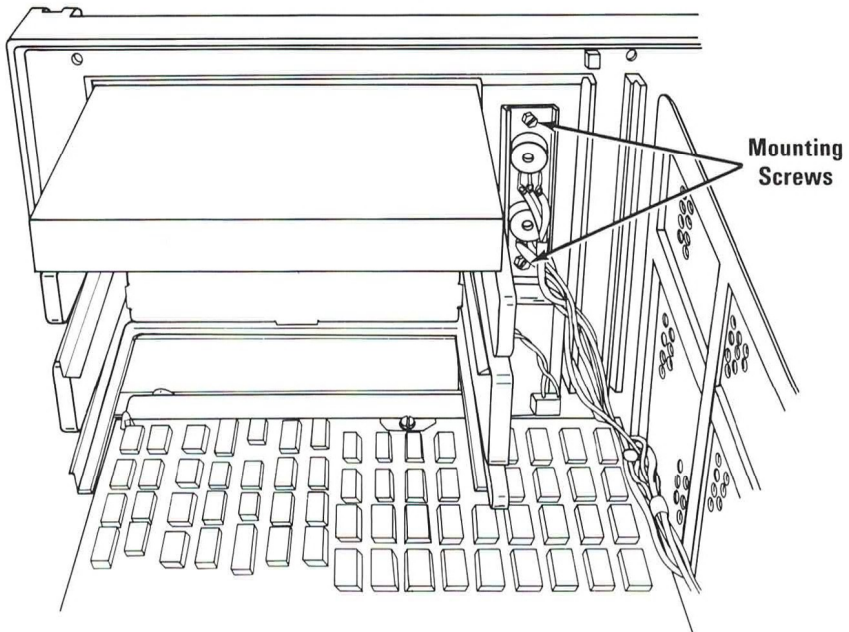
Warning: The system unit cover is loose. Be careful when handling the system unit by its cover.

4. Place the system unit in its operating position so the front panel faces you.
5. Align the six cover screw holes on the panel, insert the screws, and tighten them.
6. Connect the cables to the system unit.

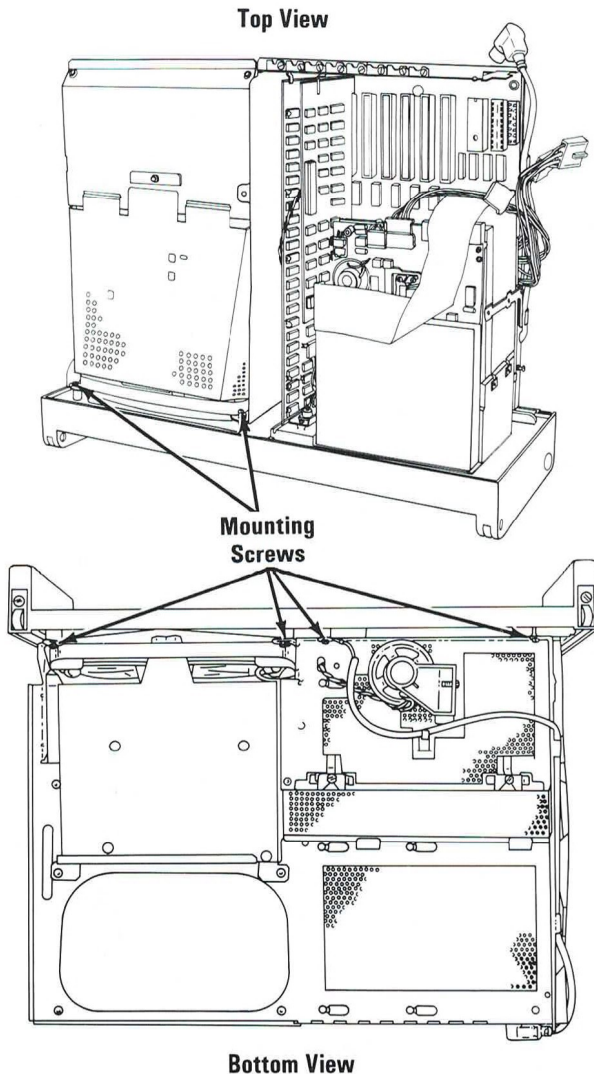


Front Panel Removal 1010

1. Remove the system unit's cover. (1005)
2. Remove the Color/Graphics Monitor Adapter. (1085)
3. Remove the Diskette Drive Adapter. (1090)
4. Remove the diskette drives. (1075)
5. Remove any option adapters installed in the system unit. (1095)
6. Remove the Brightness and Contrast control knobs from the front panel by pulling them off.
7. Remove the brightness and contrast controls by removing the two screws holding the controls and pulling the controls out (see the figure below).



8. Remove the internal keyboard-cable shield by removing its mounting screw and lifting the shield out.
9. Remove the internal keyboard-cable connector from the retainer.
10. Remove the six screws holding the front panel to the frame (see the figure below).
11. Remove the front panel.

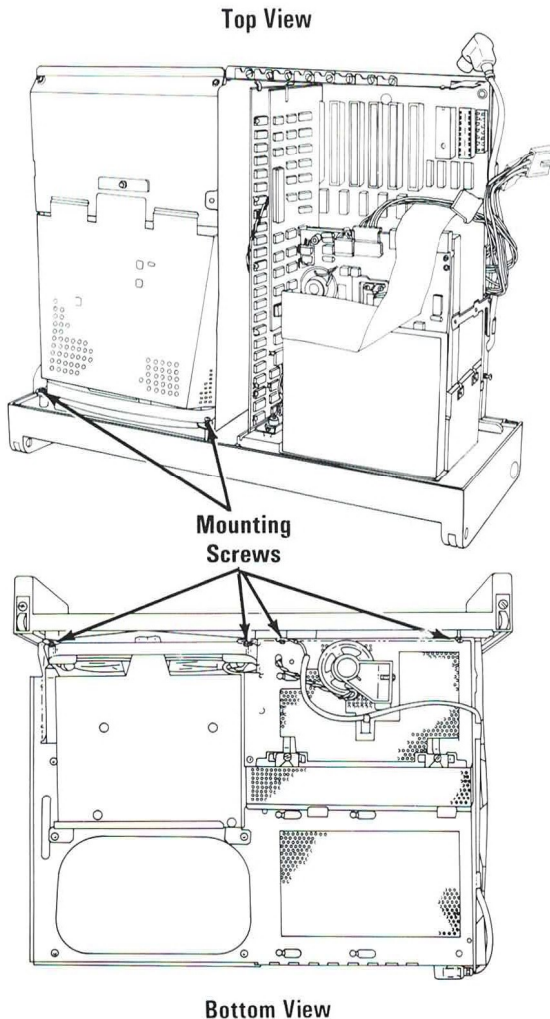


Front Panel Replacement 1011

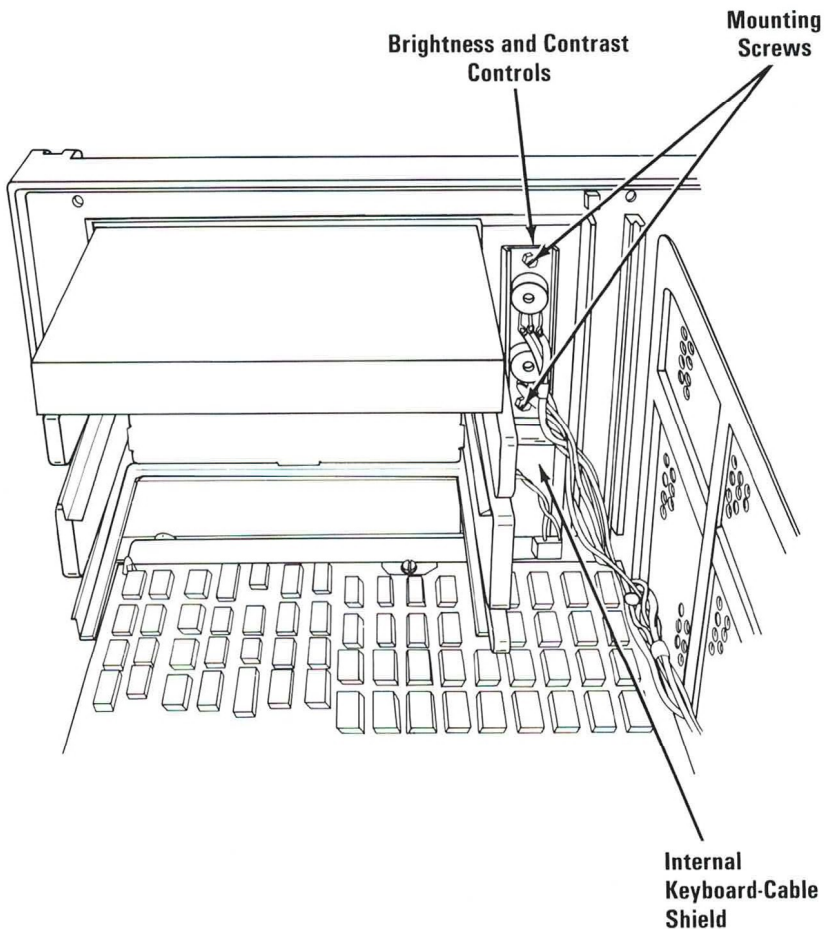
1. Remove the internal keyboard-cable retainer from the old front panel and install it in the new front panel.

Note: Place the internal display's frame mounting brackets between the front panel and the system frame before installing the screws.

2. Place the front panel in position and install the six front panel mounting screws (see the figure below).



3. Install the internal keyboard-cable connector by pushing it into the retainer until it snaps into place.
4. Install the internal keyboard-cable shield with its mounting screw. Slide the shield against the front panel and tighten the screw.
5. Install the Brightness and Contrast controls by sliding the controls into the front panel and installing the two screws that hold them in place (see the figure below).
6. Install the Brightness and Contrast control knobs.



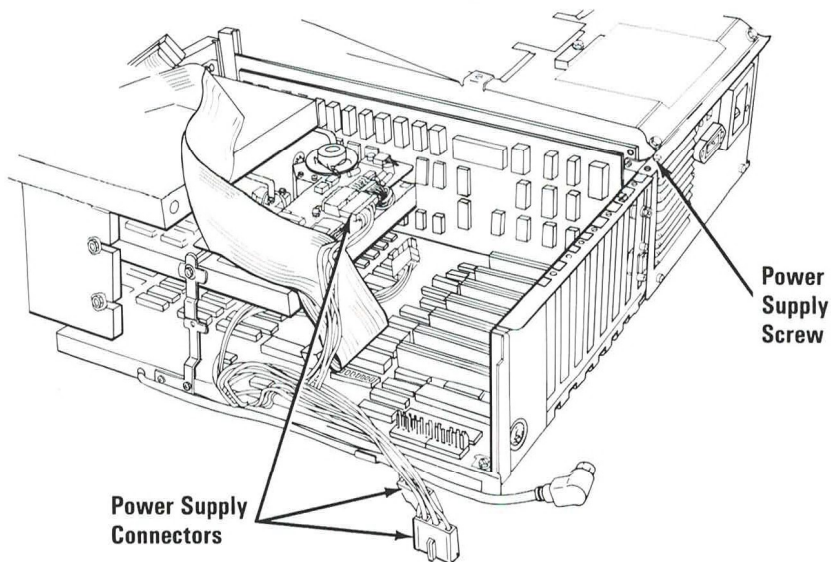
7. Install the diskette drives. (1076)
8. Install the Diskette Drive Adapter. (1091)
9. Install the Color/Graphics Monitor Adapter. (1086)
10. Install any option adapters. (1095)
11. Install the system unit's cover. (1006)

Power Supply

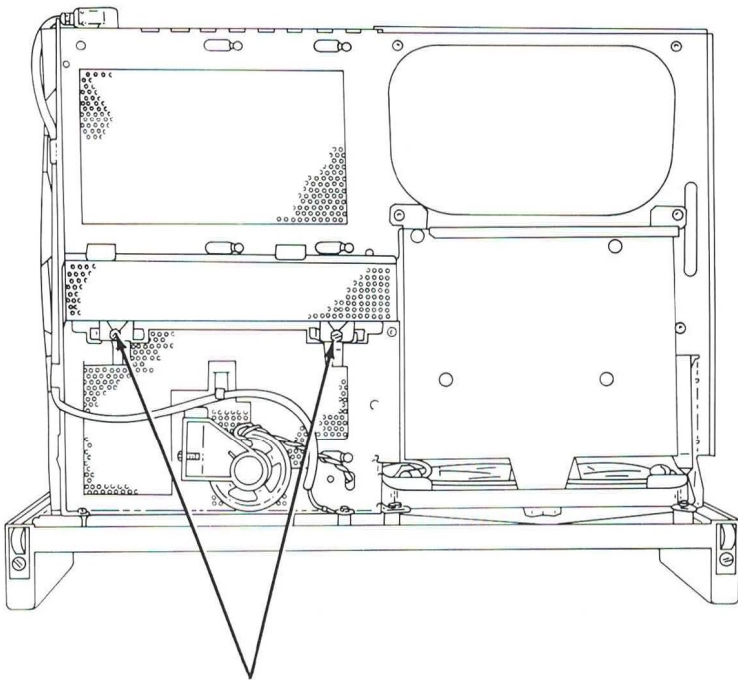
Power Supply Removal 1015

1. Set the system unit's Power switch to Off.
2. Remove the system unit's cover. (1005)
3. Remove the screw holding the power supply to the frame (see the figure below).
4. Disconnect the system-board power connectors by pulling the connectors straight up.

Warning: Do not pull on the wires when unplugging the connectors.

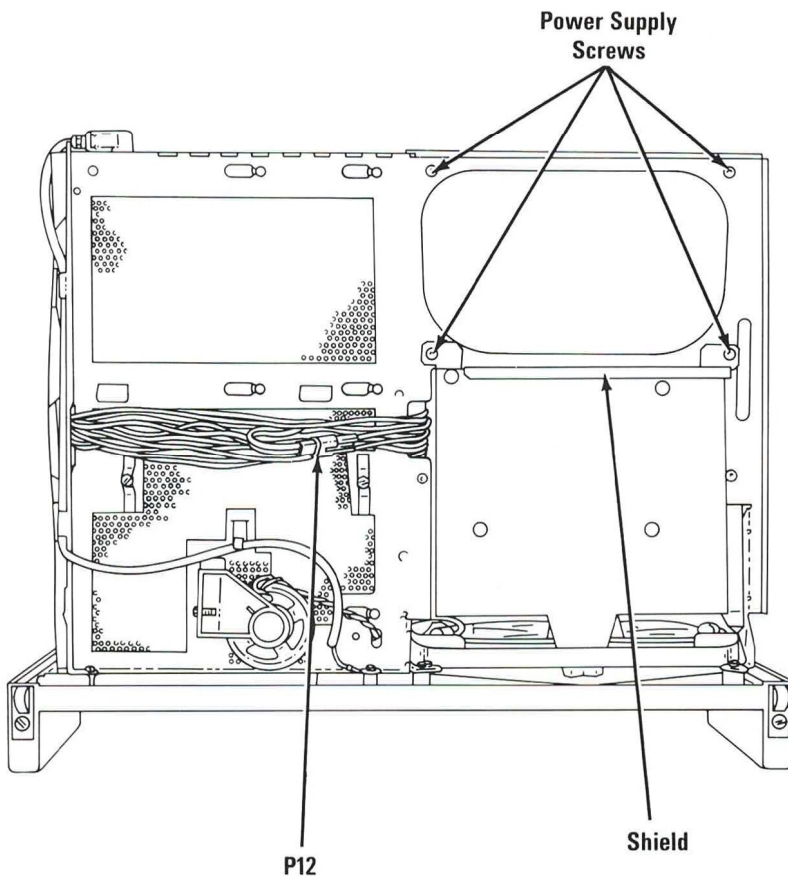


5. Disconnect the diskette-drive power connectors.
6. Set the system unit on its front panel with the bottom side facing you.
7. Remove the cable raceway cover by loosening the screws and sliding the cover off (see the figure below).



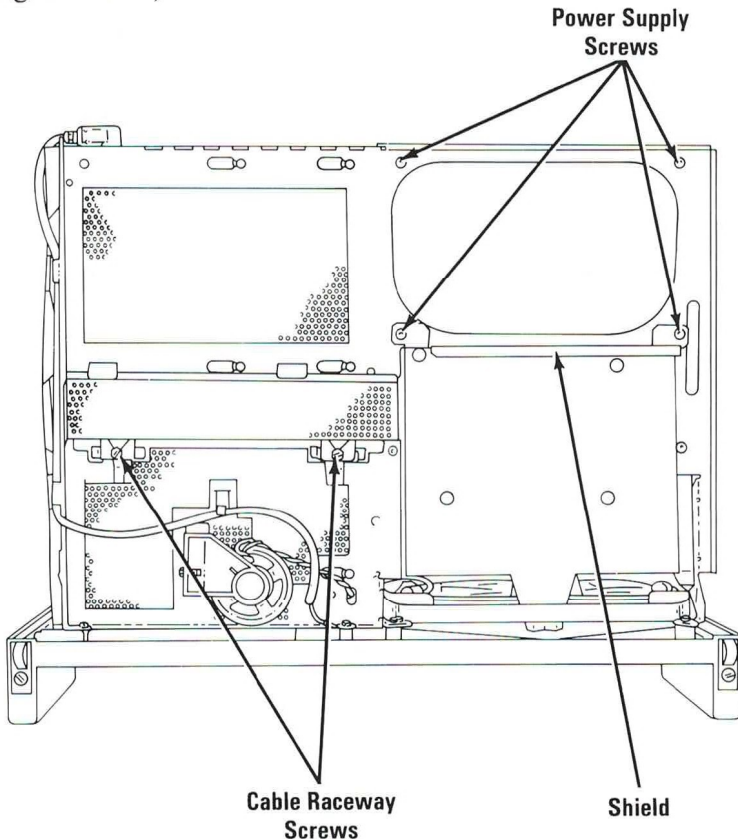
**Cable Raceway
Screws**

8. Disconnect the internal display power connector P12, which is located in the cable raceway.
9. Remove the four power supply screws, set the metal shield aside. (see the figure below).
10. Notice the routing of the power supply cables, then carefully remove the power supply by sliding it back and pulling it and the cables up and out.

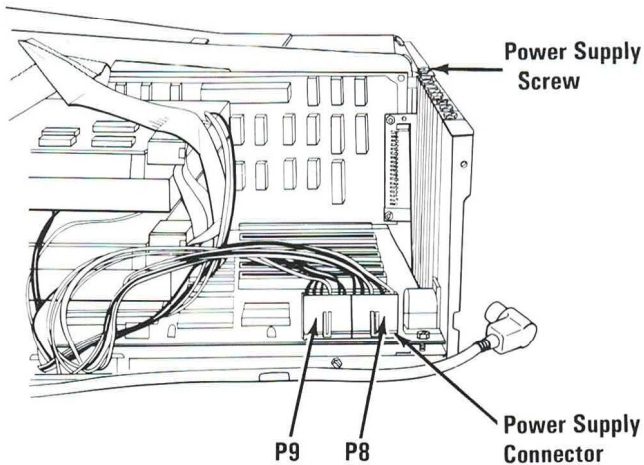
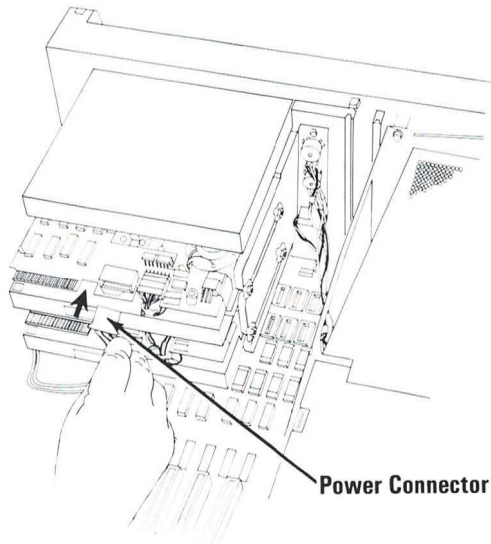


Power Supply Replacement 1016

1. Remove the information label from the bag provided and apply it to the new power supply in the area under the On/Off switch.
2. Guide the cables through the cable raceway while positioning the power supply into the system unit.
3. Connect the internal-display power connector P12, which is located in the cable raceway.
4. Install the four power-supply mounting screws (be sure to install the shield on the between the power supply and the internal display, see the figure below). Tighten the screws.
5. Install the cable raceway cover and tighten the screws (see the figure below).

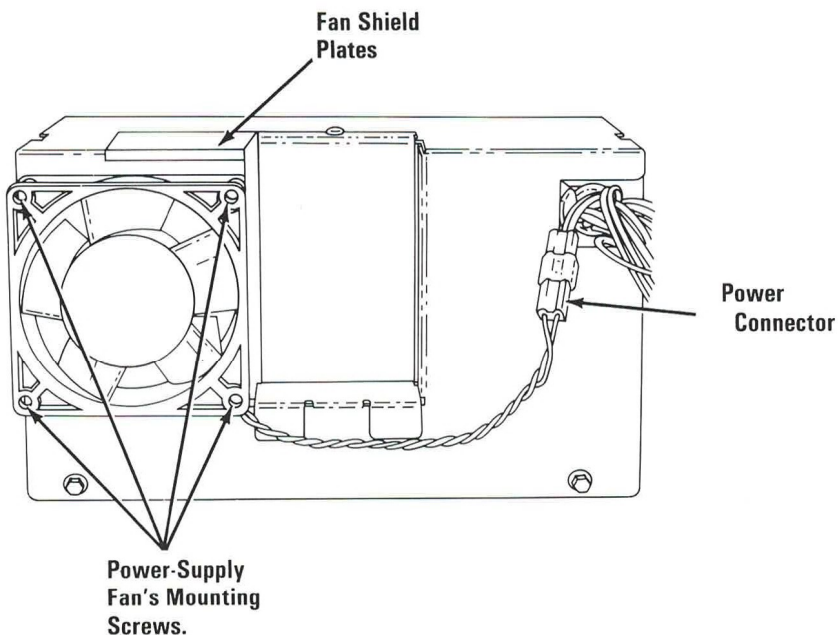


6. Connect the diskette-drive power connectors.
7. Connect the system-board power cables. Do not force them as they are keyed to fit into each position.
8. Install the screw holding the power supply to the frame.
9. Install the system unit's cover. (1006)



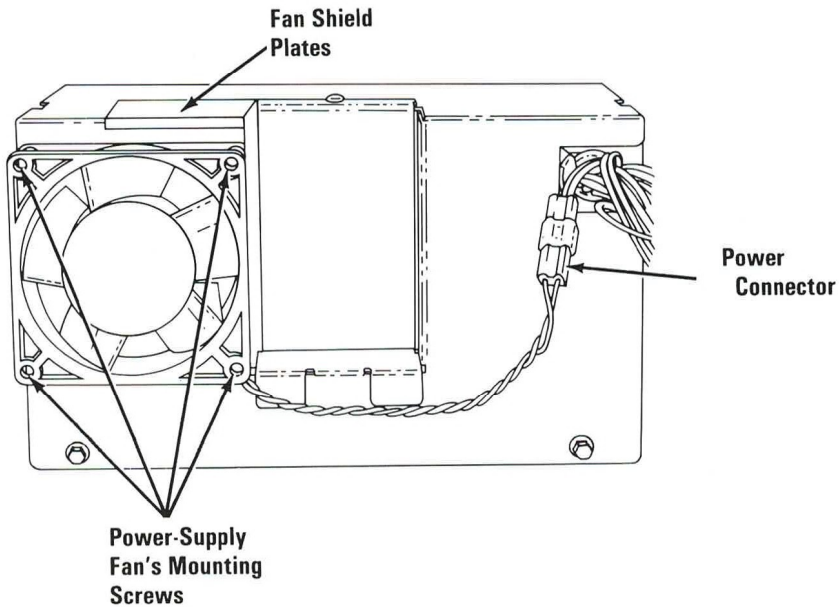
Power Supply Fan Removal 1020

1. Unplug the system unit's power cord from the wall outlet.
2. Remove the system unit's cover. (1005)
3. Remove the power supply. (1015)
4. Disconnect the power-supply fan's power connector (see the figure below).
5. Remove the four power-supply fan's mounting screws (see the figure below).
6. Set the fan shield plates aside.



Power Supply Fan Replacement 1021

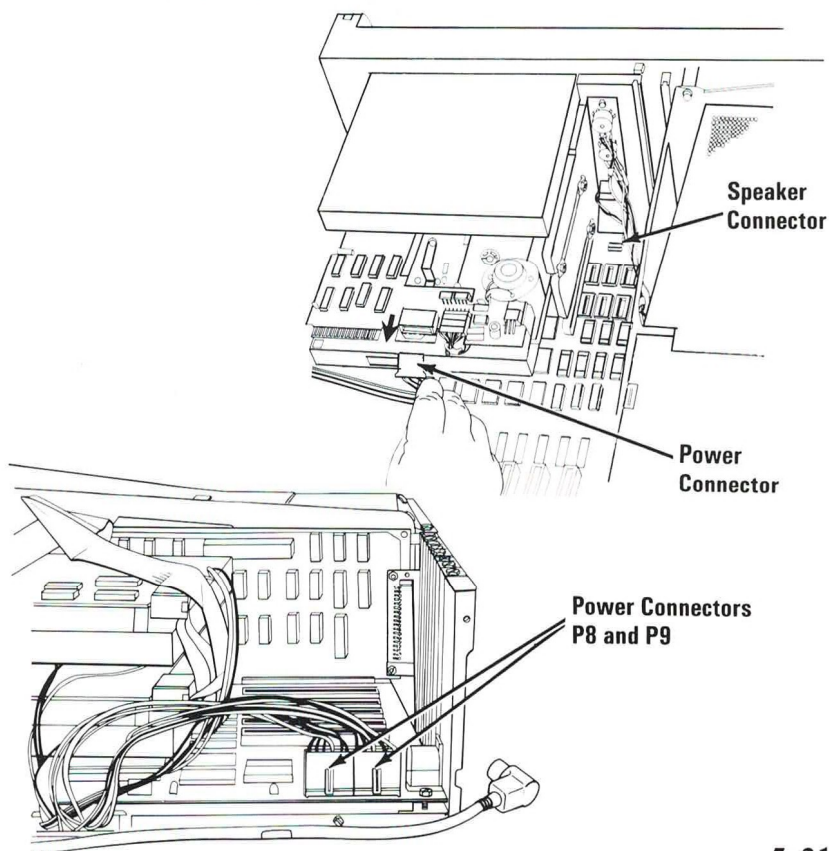
1. Place the shield in the position shown (see the figure below).
2. Install the power-supply fan with the four mounting screws (see the figure below).
3. Connect the power-supply fan power connector (see the figure below).
4. Install the power supply. (1016)
5. Install the system unit's cover. (1006)



System Board

System Board Removal 1025

1. Set the system unit's Power switch to Off.
2. Remove the system unit cover. (1005)
3. Remove all option adapters. (1095)
4. Remove the Color/Graphics Monitor Adapter. (1085)
5. Remove the diskette drives. (1075)
6. Disconnect the system board power connectors P8 and P9.
7. Disconnect the speaker connector by pulling straight up on the connector, not on the wires.

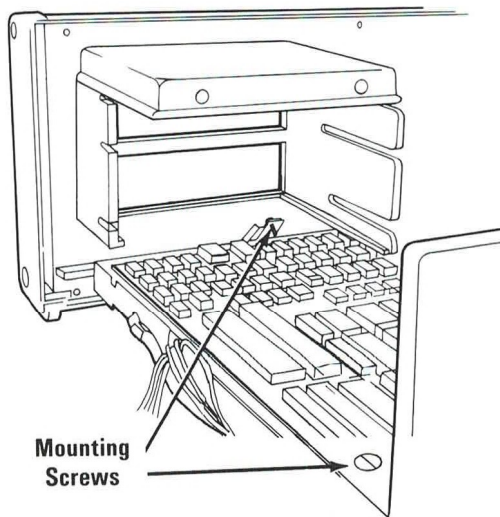


8. Remove the two system-board mounting screws.

Note: The front mounting screw is only accessible through the front panel. If your system contains only one diskette drive you must remove the bottom blank to gain access to the front mounting screw.

9. Slide the system board out the right side of the system unit.

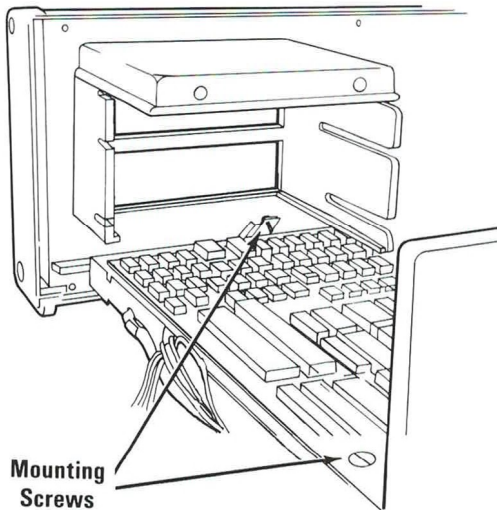
Note: If you are going to install a new system board, remove the front system board mounting assembly, the plastic standoffs, all the memory modules, and the Math Coprocessor (if installed). A new system board will not have these items.



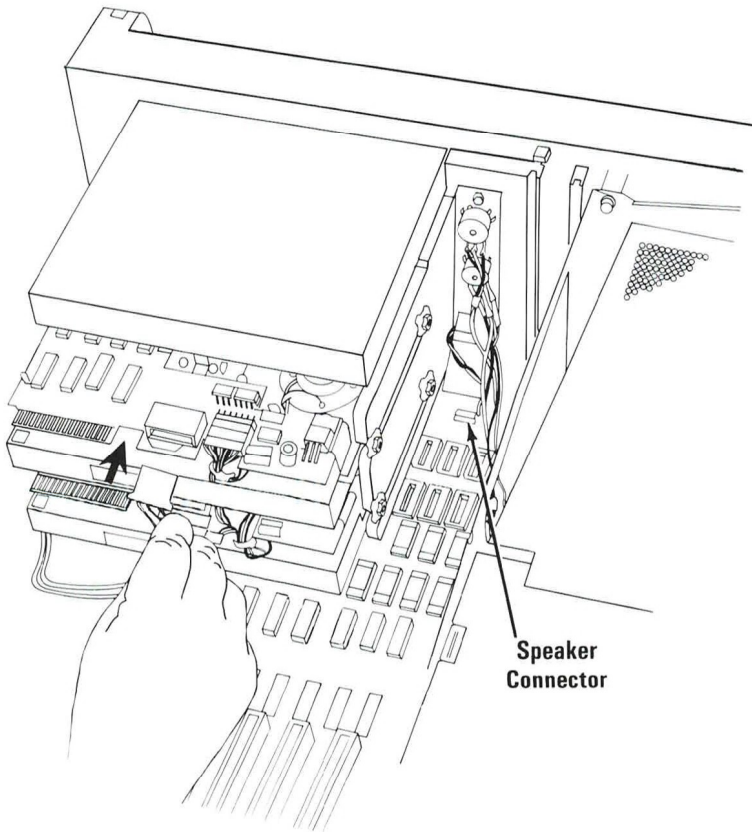
System Board Replacement 1026

Note: If this is a new system board, install, the front system board mounting assembly, the plastic standoffs, the memory modules, and the Math Coprocessor (if installed), that you removed from the old system board. Check your switch settings before installing the new system board (see section 6).

1. Slide the system board into the system unit until the standoffs fit into their mounting slots.
2. Install the two system-board mounting screws.
3. Connect the system-board power cable connectors P8 and P9.

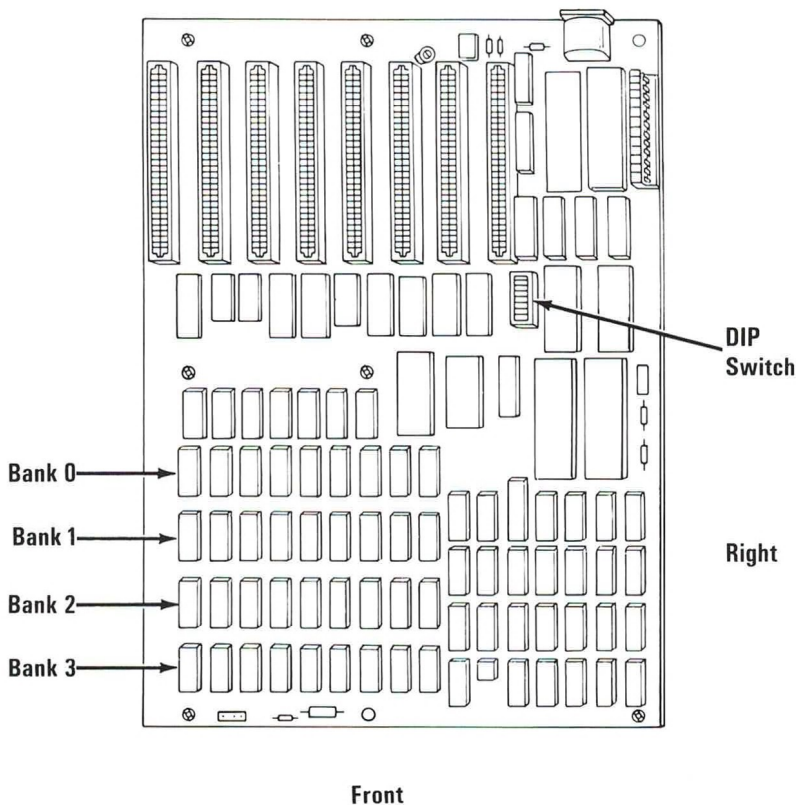


4. Connect the speaker connector.
5. Install the diskette drives. (1076)
6. Install the option adapters. (1096)
7. Install the Color/Graphics Monitor Adapter. (1086)
8. Install the system unit cover. (1006)

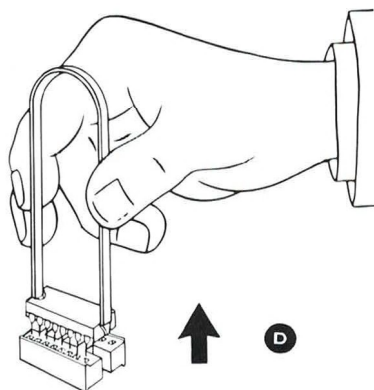
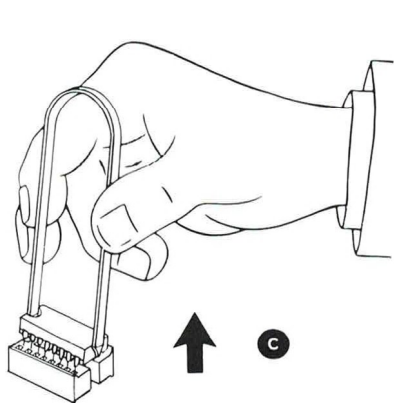
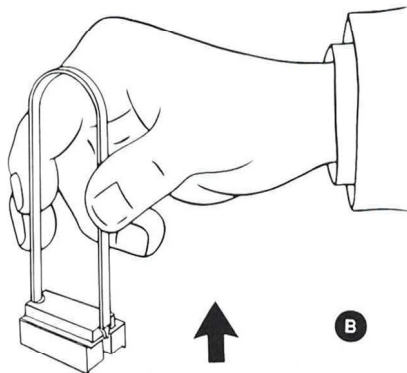


64KB Memory Module Removal 1030

1. Remove the system unit's cover. (1005)
2. Remove the system board. (1025)
3. Find the module to be removed (if you are not sure which module needs to be replaced, see PIC 3-200-1 to determine which module is failing.)

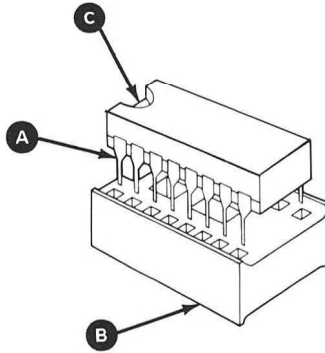


4. To separate a module from its socket, grasp the module as shown in **B** , then lift in a two-step motion, as shown in **C** and **D** , to avoid bending the pins.



64KB Memory Module Replacement 1031

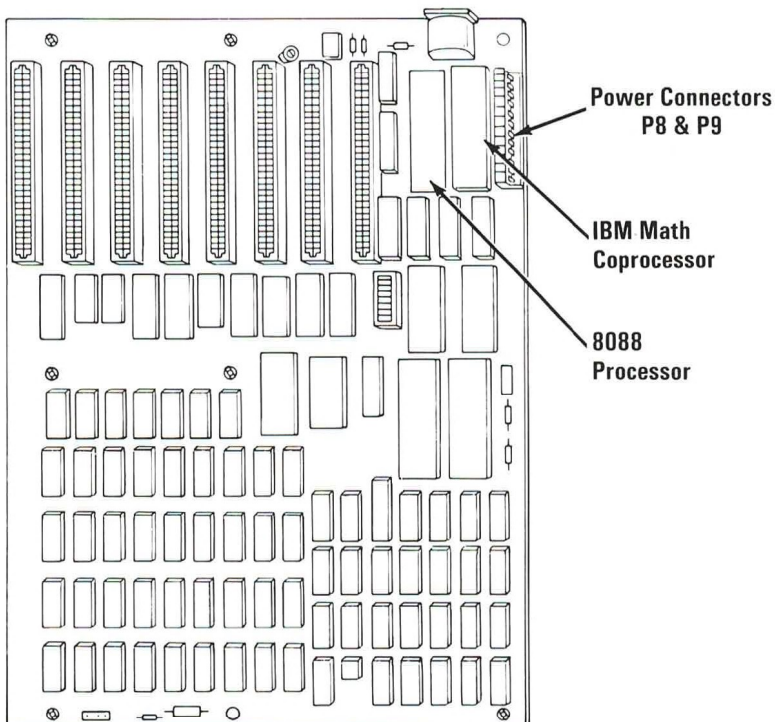
1. Align the module pins, **A**, with the socket, **B**, and firmly press the module into place. Notch **C** on the module should be aligned with the notch in the socket.
2. Install the system board. (1026).
3. Install the system unit's cover. (1006).
4. Connect the cables to the system.



Math Coprocessor Removal 1035

1. Remove the system unit's cover. (1005)
2. Remove the system-board power connectors P8 and P9.
3. Find the Math Coprocessor on the system board (see the figure below).

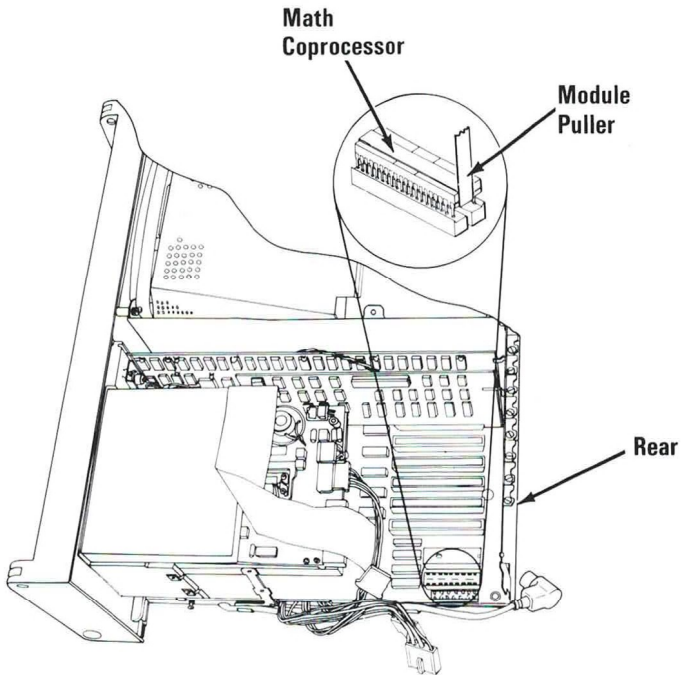
Warning: The coprocessor is sensitive to static. Maintain personal grounding by touching the system frame with one hand.



Front

4. Grasp the Math Coprocessor with a module puller and lift it carefully from its socket.

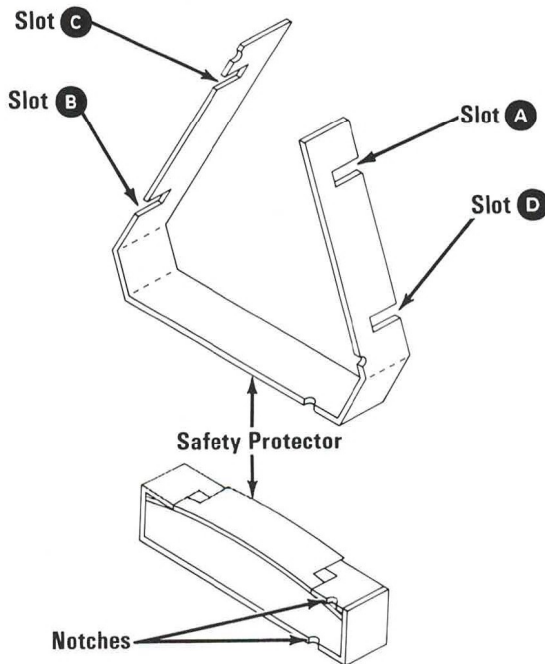
Warning: The pins on the Math Coprocessor are bent easily.



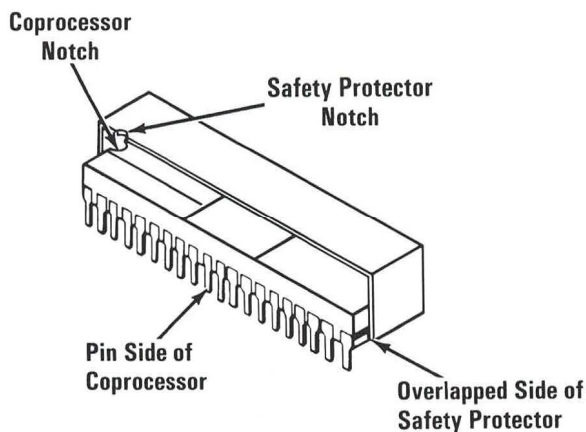
Math Coprocessor Replacement 1036

Note: Before you install the Math Coprocessor, you must install a safety protector on it. The Math Coprocessor can be identified by its gold-colored pins.

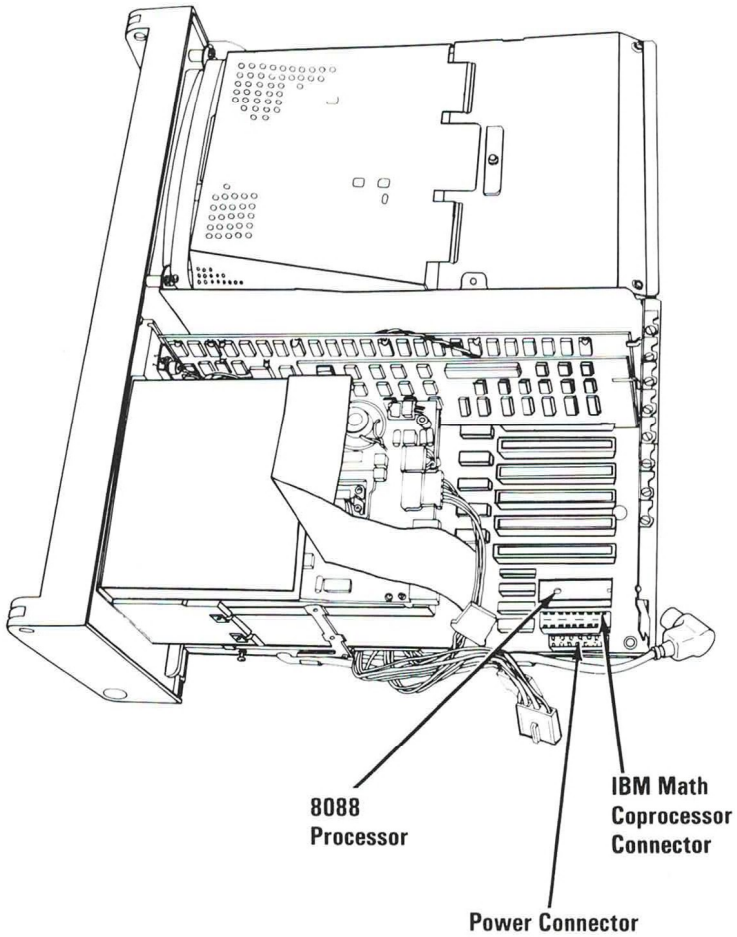
1. Assemble the safety protector as shown in the figure below.
2. Insert slot **A** into slot **B** , then insert slot **C** into slot **D** .



3. Insert the coprocessor into the safety protector as shown in the figure below. Make sure the notch in the safety protector is on the same end as the notch in the coprocessor. The overlapped portions of the safety protector should be on the bottom or pin side of the coprocessor.

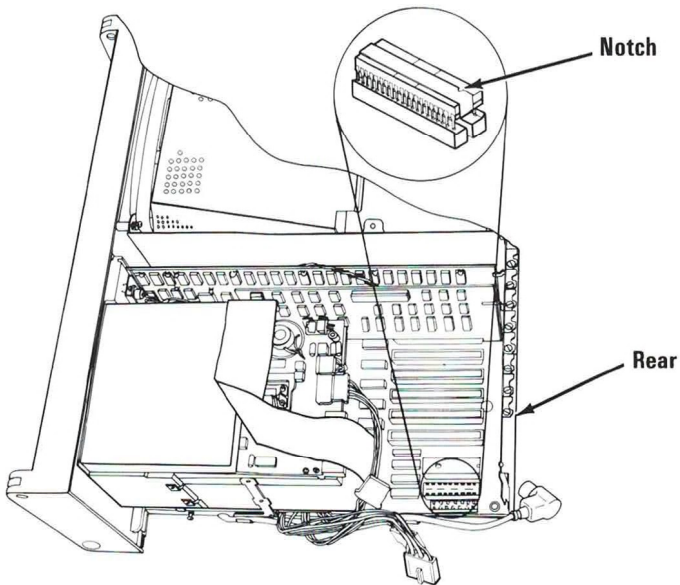


4. Study the system board shown below. The coprocessor will be installed on the system board in the location shown.



Warning:

- The coprocessor is sensitive to static. Maintain personal grounding while installing the coprocessor by touching the system frame with one hand.
 - Incorrect placement of the coprocessor can result in damage to the system board or coprocessor.
 - The pins on the coprocessor are easily bent.
5. Compare your coprocessor with the one in the figure below. Find the notch shown in the figure. The notch must face the 8088 Processor and be toward the rear of the system board. If this is not possible, the safety protector is not assembled correctly.
 6. Carefully align the pins with the connector and firmly press the coprocessor into place.



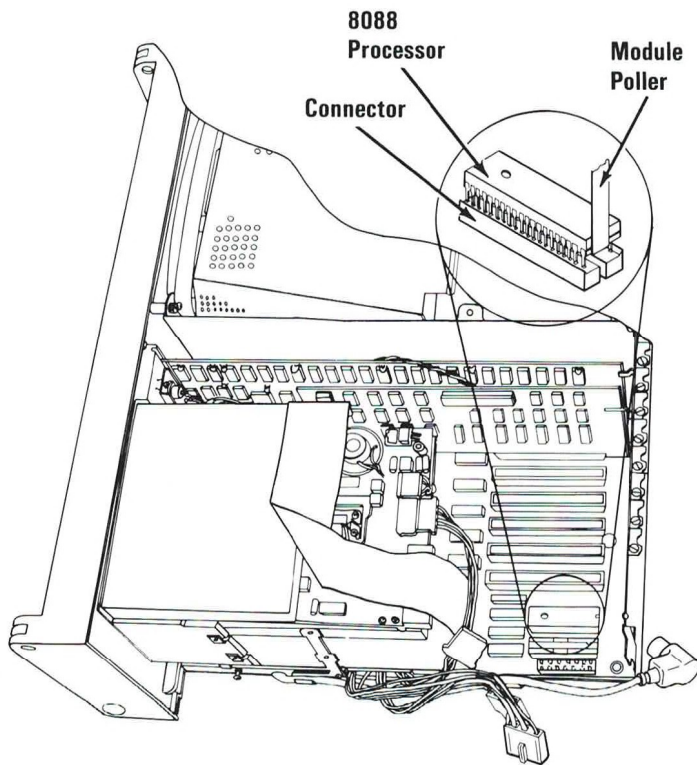
7. Connect the system-board power connectors P8 and P9.
8. Install the system unit's cover. (1006)
9. Connect the cables to the system unit.

8088 Processor Removal 1040

Warning:

- The pins on the processor module are easily bent. Be careful not to bend the pins when removing the processor.
 - The coprocessor is sensitive to static. Maintain personal grounding by touching the system frame with one hand.
1. Set the Power switch on the system unit (and expansion unit, if attached) to Off.
 2. Unplug the system unit's (and expansion unit's) power cords from the wall outlet.
 3. Disconnect all cables from the rear of the system unit.
 4. Remove the system unit's cover. (1005)

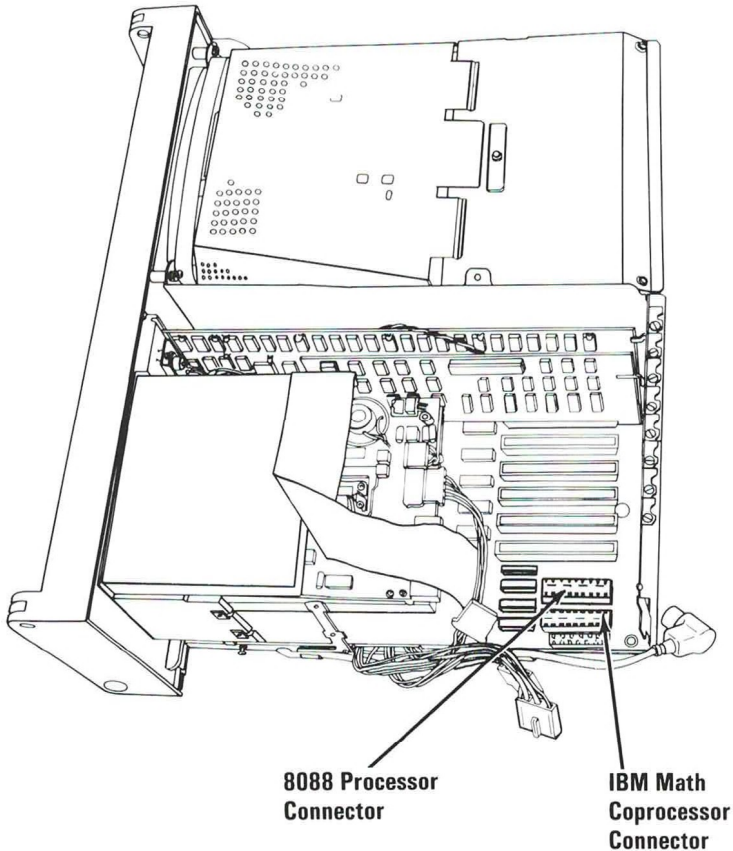
5. Find the 8088 Processor on the system board shown below.
6. Using a module puller, carefully remove the processor.



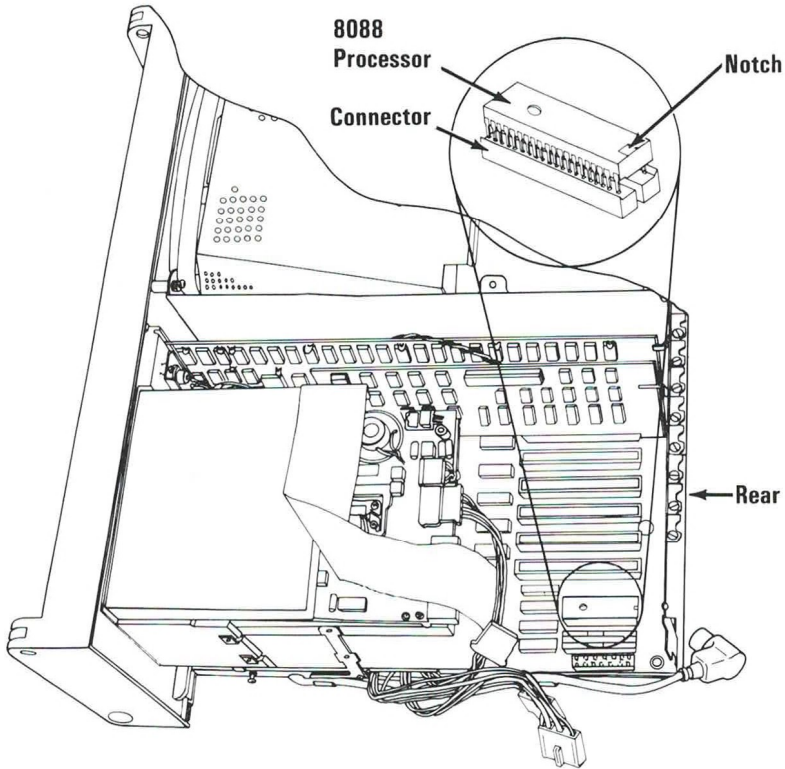
8088 Processor Replacement 1041

Warning:

- The pins on the processor module are easily bent. Be careful not to bend the pins when removing the processor.
 - The processor is sensitive to static. Maintain personal grounding by touching the system frame with one hand.
1. Refer to the figure below and find the 8088 Processor Connector on the system board.

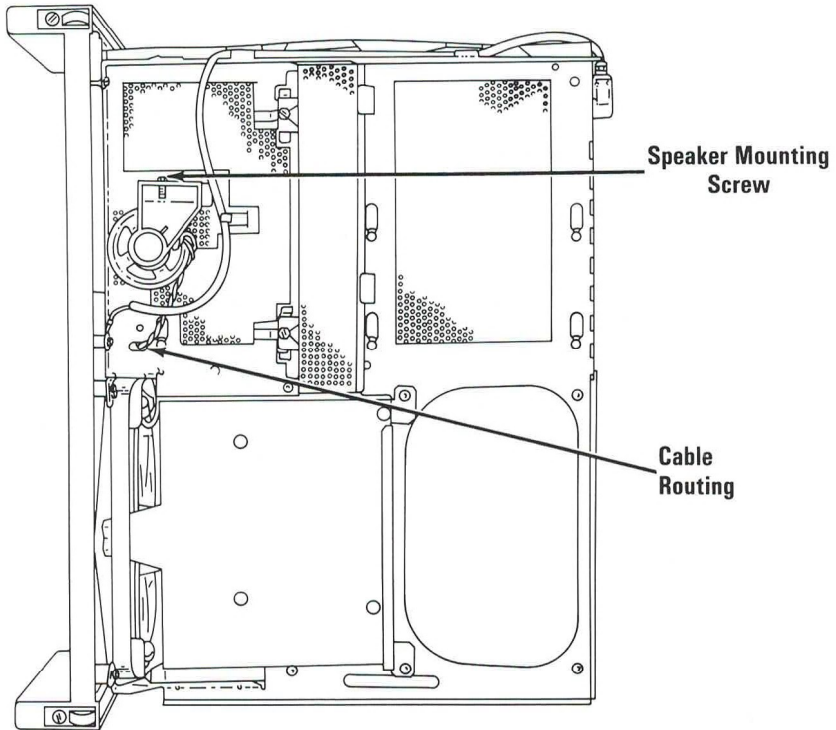


2. Carefully align the pins on the processor with its connector and firmly press the processor in place. Be sure the notch on the processor faces the rear of the system board.
3. Install the system unit's cover. (1006)
4. Install any cables removed from the rear of the system unit.



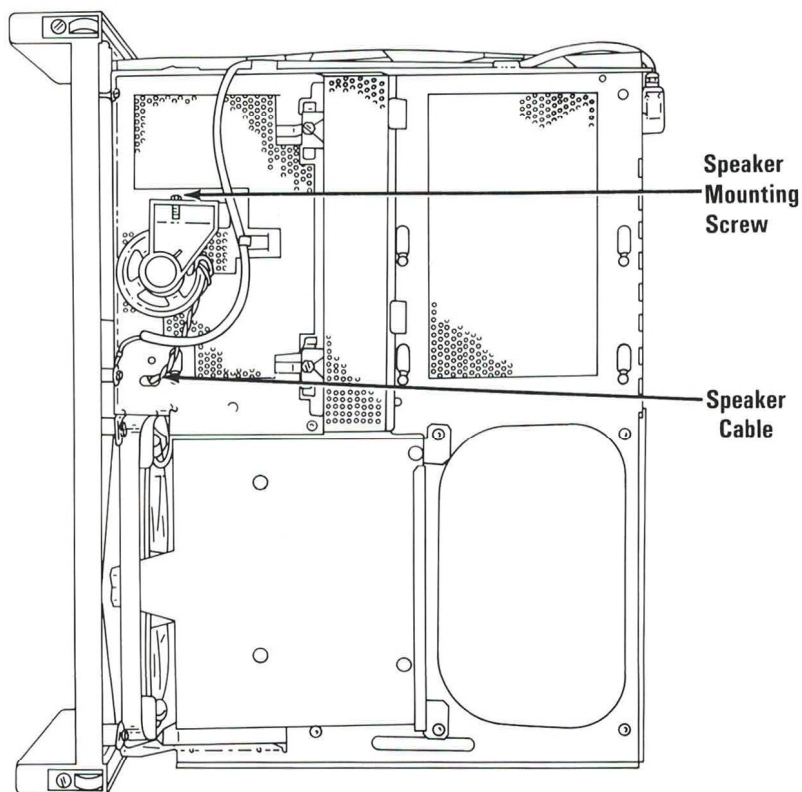
Speaker Removal 1045

1. Remove the system unit's cover. (1005)
2. Place the system unit on its left side (see figure below).
3. Notice the speaker cable's routing for reinstallation purposes, then disconnect the speaker connector from the system board.
4. Remove the speaker's mounting screw.
5. Remove the speaker.



Speaker Replacement 1046

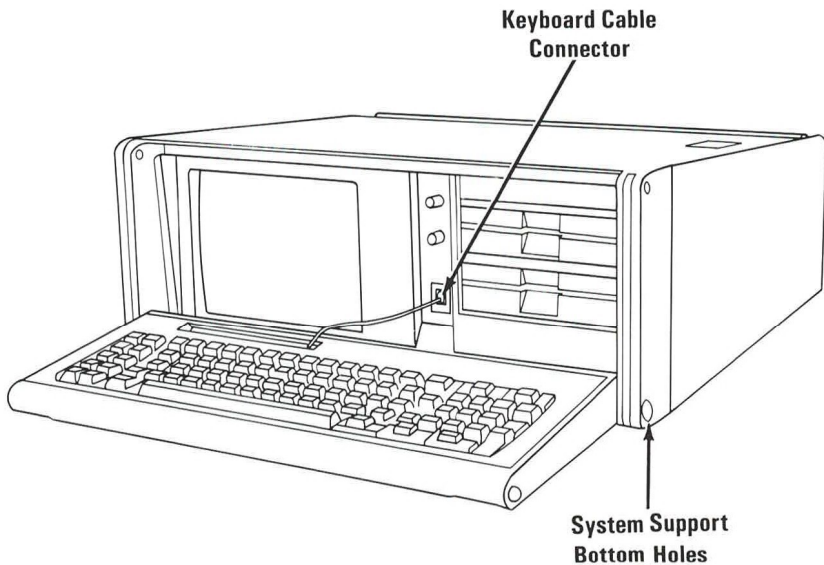
1. Install the speaker and speaker mounting screw. Tighten the screw.
2. Guide the speaker cables through the frame, as shown below, and plug the connector to the system board.
3. Install the system unit's cover. (1006)
4. Connect the cables to the system unit.



Keyboard

Keyboard Removal 1050

1. Place the system unit in its operating position and release the keyboard by pushing the keyboard release latches.
2. Disconnect the keyboard cable.
3. Remove the keyboard from the system unit by pushing in the bottom holes on the system supports. This separates the keyboard from the system unit.

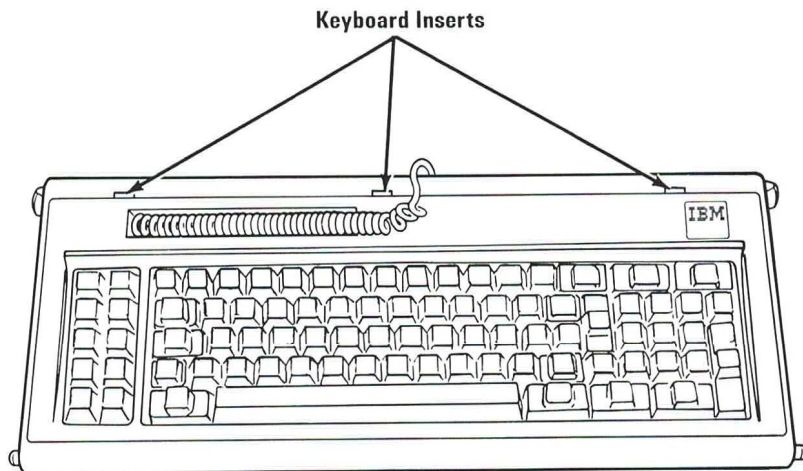


Keyboard Replacement 1051

1. Connect the keyboard to the system unit by compressing the keyboard pivots and inserting them into the front panel. Then slide the keyboard into place.
2. Connect the keyboard cable.
3. Place the keyboard in its carrying position by lifting it up and snapping the keyboard latches into place.

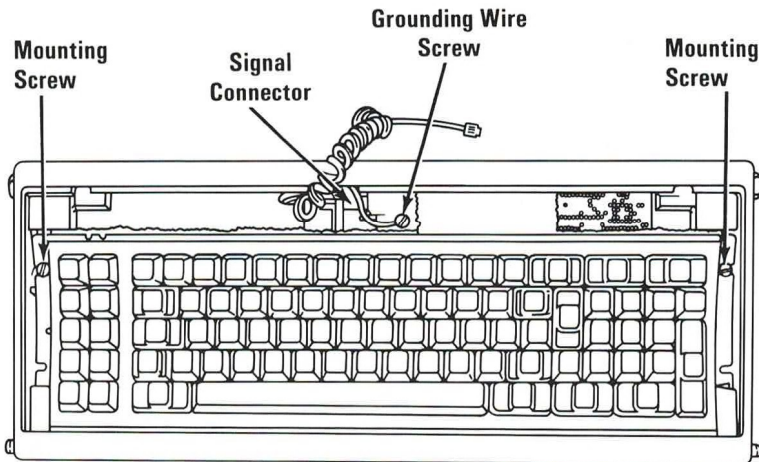
Keyboard Cover Removal 1055

1. Set the system unit's Power switch to Off.
2. Remove the keyboard. (1050)
3. Separate the keyboard cover from its base by inserting a flat-blade screwdriver into the inserts on the top of the keyboard (see the figure below).
4. Lift the keyboard top cover at the front edge and remove.
5. To install the cover, reverse this procedure.



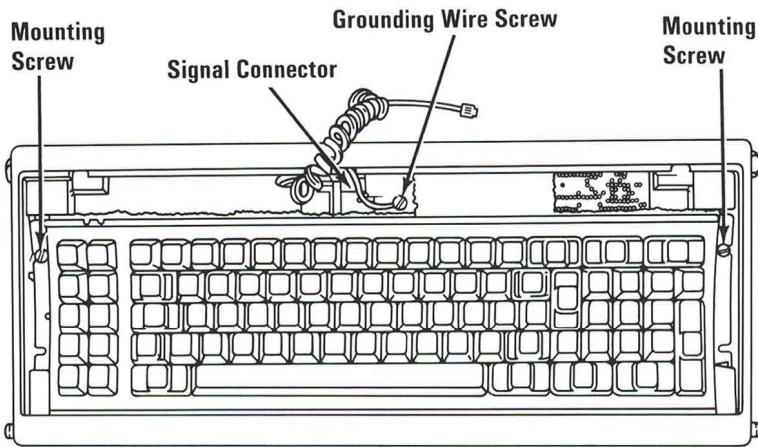
Keyboard Assembly Removal 1060

1. Set the system unit's Power switch to Off.
2. Remove the keyboard. (1050)
3. Remove the keyboard's top cover. (1055)
4. Remove the two keyboard assembly mounting screws (see the figure below).
5. Disconnect the keyboard signal cable from the keyboard assembly.
6. Remove the ground wire from the screw shown.
7. Lift the keyboard assembly out of the cover.



Keyboard Assembly Replacement 1061

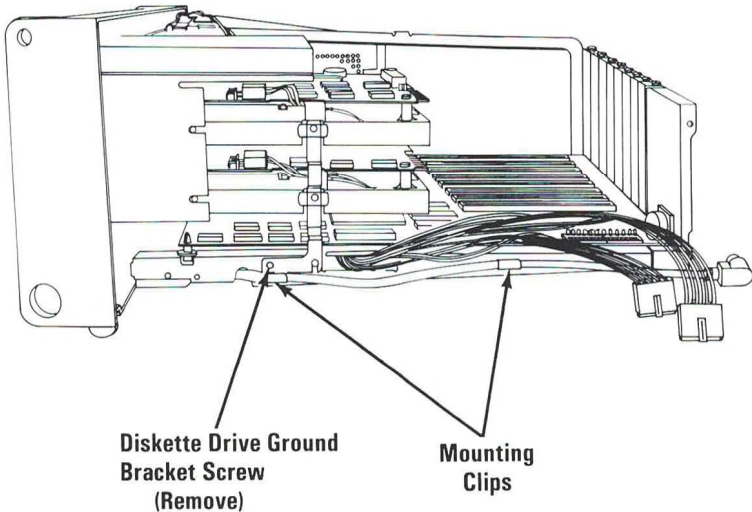
1. Place the keyboard assembly into its cover.
2. Connect the keyboard signal cable to the keyboard assembly.
3. Install the ground wire on the screw shown.
4. Insert the two keyboard assembly mounting screws and tighten.
5. Install the keyboard cover. (1055)
6. Connect the keyboard to the system unit. (1051)



Internal Keyboard Cable Removal 1062

1. Remove the system unit's cover. (1005)
2. Remove the Diskette Drive Adapter. (1090)
3. Remove the Color/Graphics Monitor Adapter. (1086)
4. Remove any option adapter (if installed). (1095)
5. Disconnect the internal keyboard cable at the rear of the system board.
6. Remove the internal keyboard-cable shield mounting screw and remove the shield.

7. Remove the internal keyboard-cable connector by spreading the tabs on the retainer and push the connector towards the rear of the system unit.
8. Remove the internal keyboard-cable grounding wire.
9. Remove the front diskette drive ground bracket screw.
10. Remove the internal keyboard cable from the mounting clips.

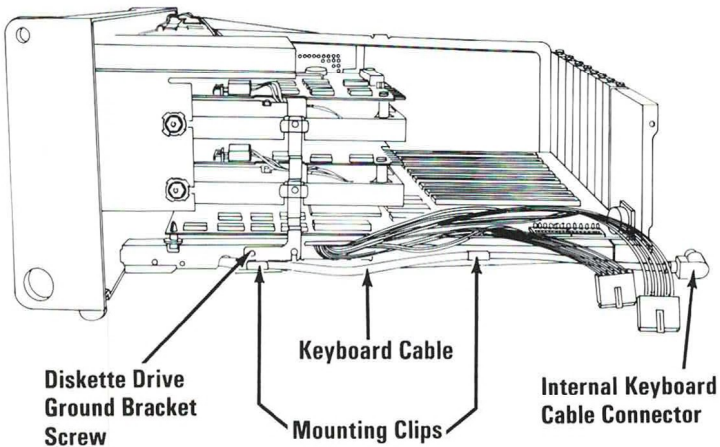


Internal Keyboard Cable Replacement 1063

1. Connect the internal keyboard cable at the rear of the system board.
2. Route the internal keyboard cable in the mounting clips.

Note: Remove the slack in the cable between the rear connector and the mounting clips.

3. Install the diskette drive ground bracket screw.

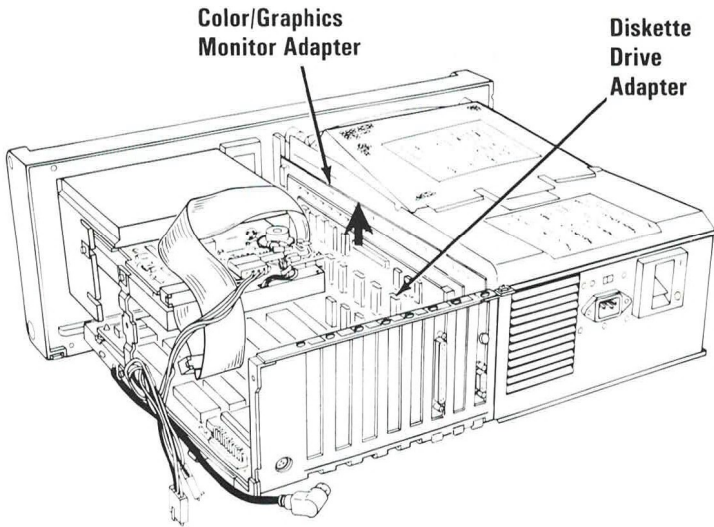


4. Install the internal keyboard-cable connector by pushing the connector into the retaining bracket on the front panel.
5. Install the internal keyboard-cable grounding wire.
6. Install the internal keyboard-cable shield and its mounting screw. Slide the shield against the front panel and tighten the screw.
7. Install the Color/Graphics Monitor Adapter. (1086)
8. Install any option adapter (if removed). (1096)
9. Install the Diskette Drive Adapter. (1091)
10. Install the system unit's cover. (1006)

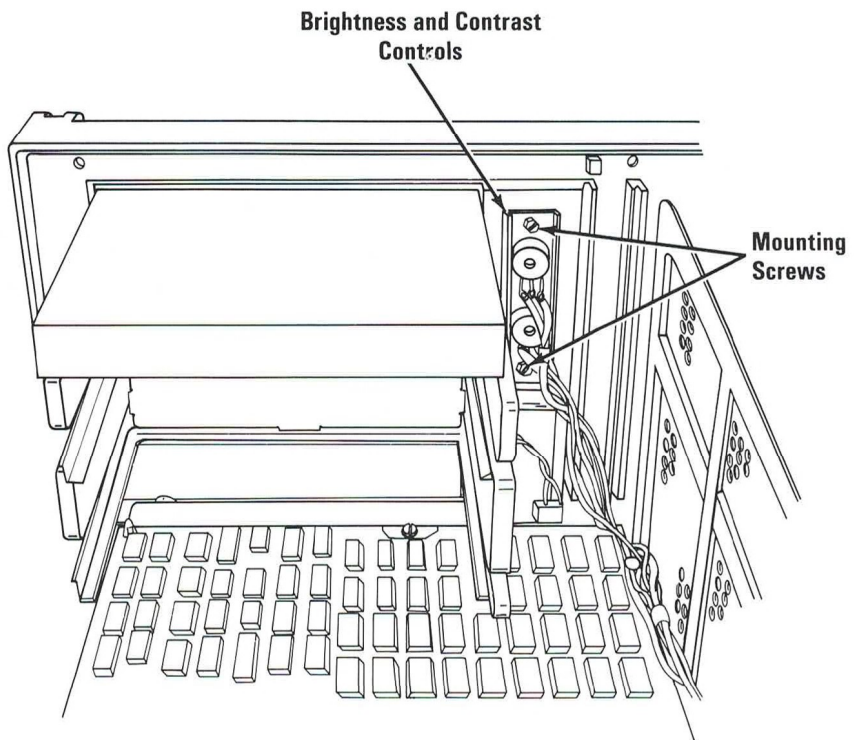
Displays

Internal Display Removal 1065

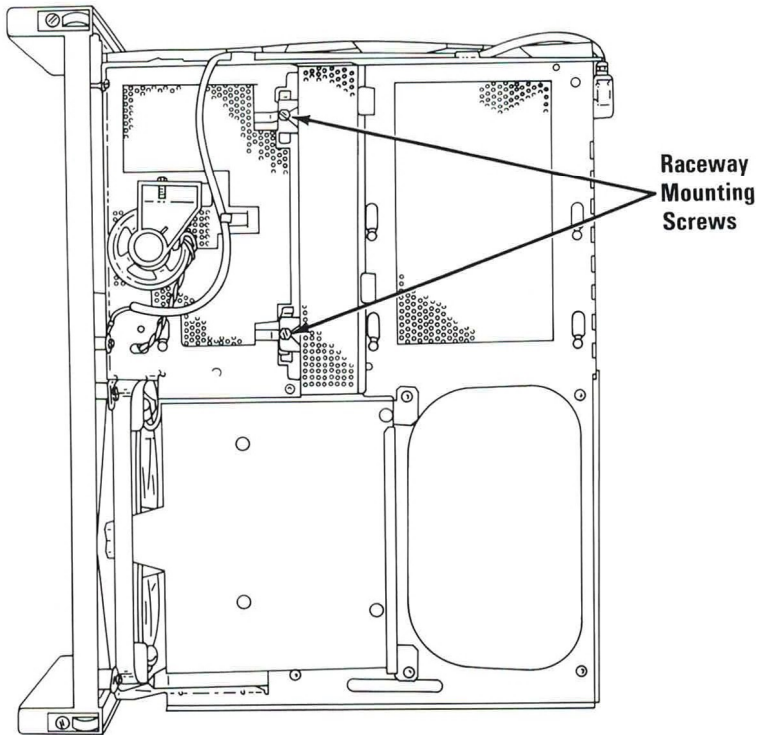
1. Remove the system unit's cover. (1005)
2. Set the system unit in its operating position.
3. Remove the Color/Graphics Monitor Adapter and set it aside. (1085)
4. Remove the Diskette Drive Adapter. (1090)
5. Remove the option adapters (if installed). (1095)



6. Remove the Brightness and Contrast knobs from the front of the system unit by pulling them off.
7. Remove the two screws holding the Brightness and Contrast controls to the system unit and pull the controls out.

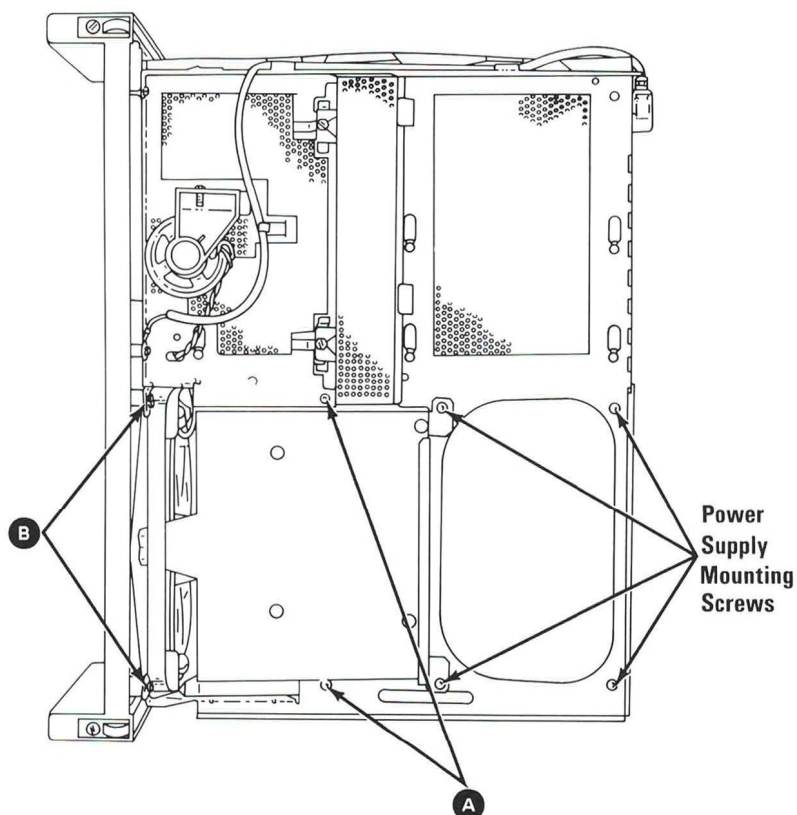


8. Place the system unit with the bottom side facing you (see the figure below).
9. Remove the cable raceway by removing the screws and sliding the cover off (see the figure below).
10. Disconnect the display's power connector (P12), which is in the cable raceway.

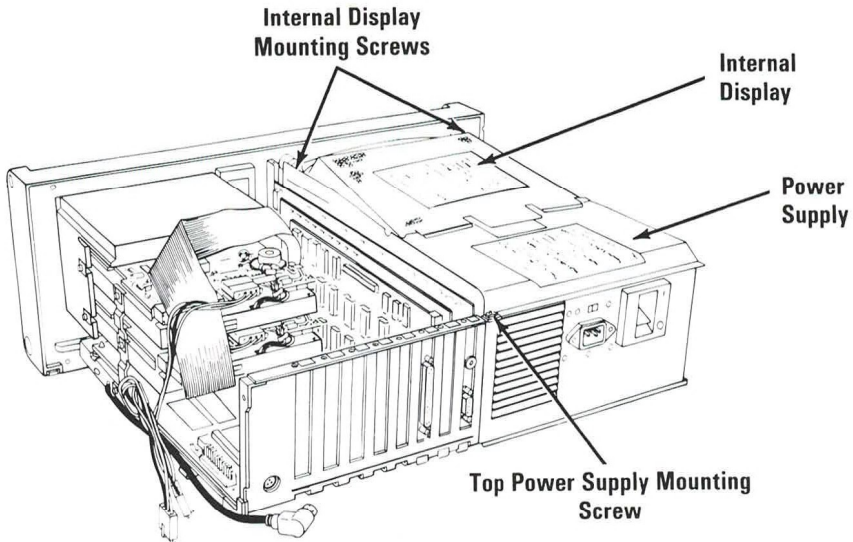


11. Remove the two screws **A** from the bottom of the internal display unit.
12. Remove the internal-display mounting screws **B**.
13. Remove the four power-supply screws.

Warning: The power supply is now loose in the system unit. Handle with care when moving the system unit.



14. Set the system unit in its operating position.
15. Remove the two internal-display mounting screws (see the figure below).
16. Remove the top power-supply mounting screw.
17. Pull the power supply out of the way and lift the display from the system unit.

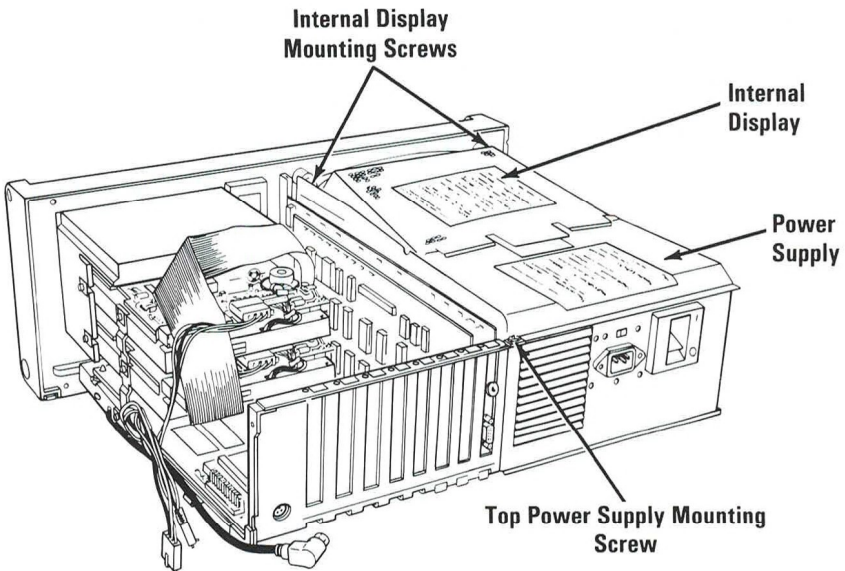


Internal Display Replacement 1066

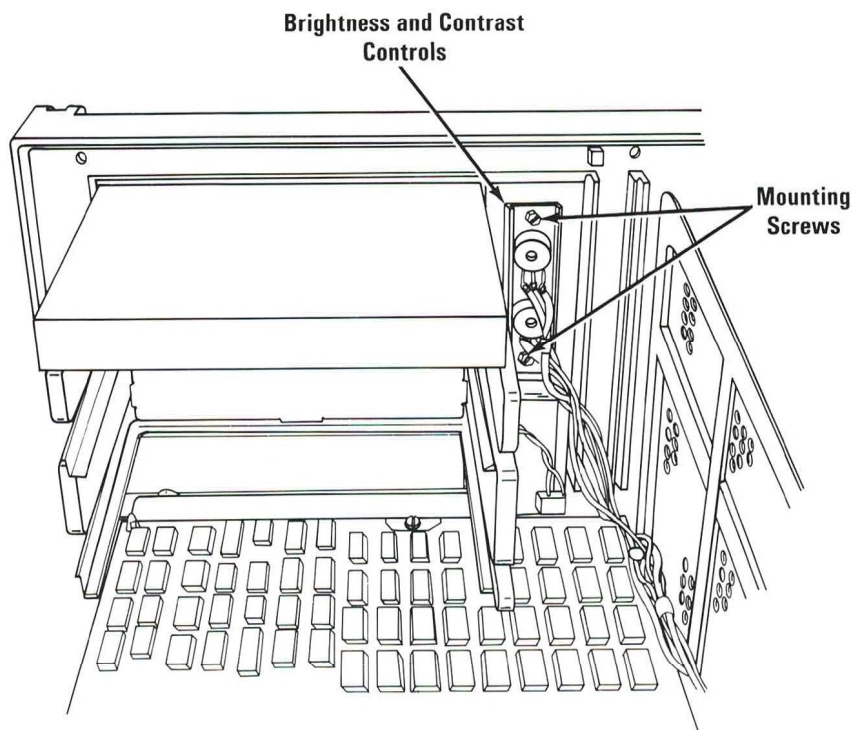
1. Pull the power supply out of the way and place it by the rear of the system unit.
2. Place the internal display into the system unit and guide the power connector down through the hole in the frame to the cable raceway.

Note: Place the internal display frame mounting brackets between the front panel and the system frame before installing the screws.

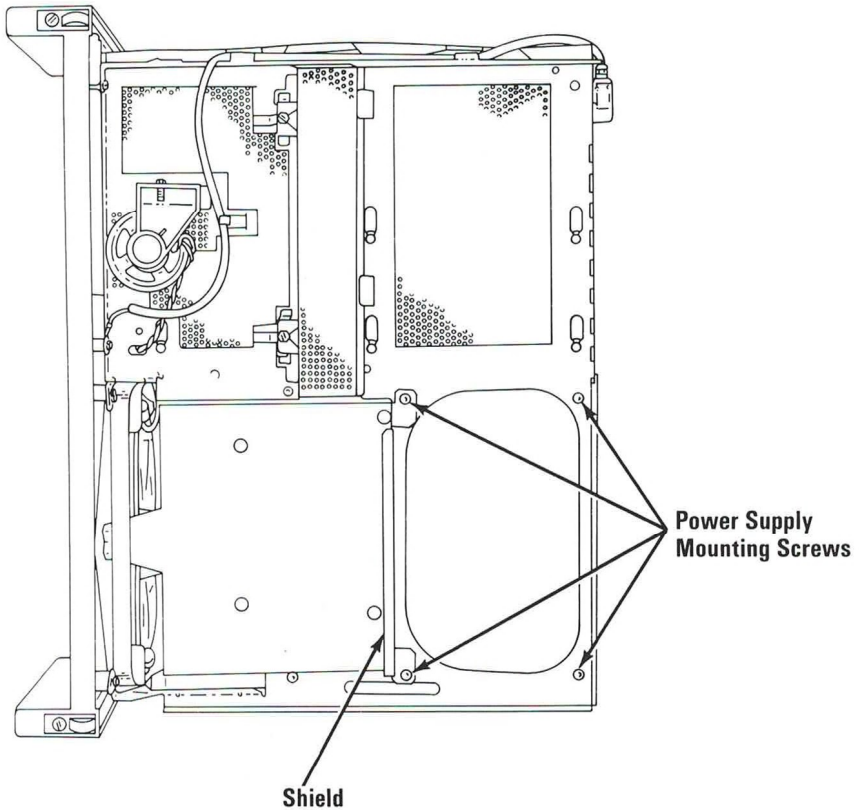
3. Install the two internal display mounting screws and tighten them.
4. Slide the power supply into place and install the top power-supply mounting screw.



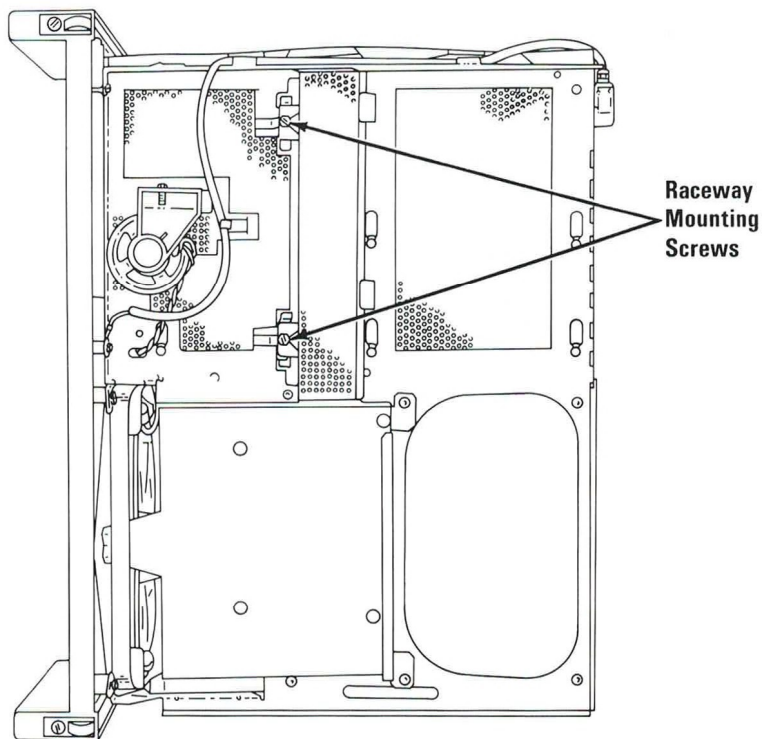
5. Install the Brightness and Contrast controls and install the two mounting screws that hold them in place.
6. Install the Brightness and Contrast knobs on the front of the system unit.



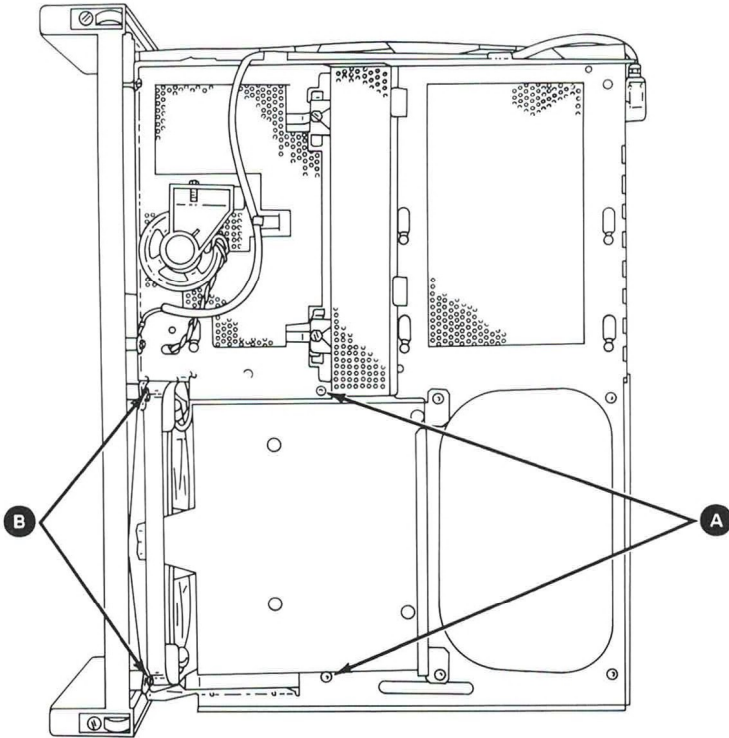
7. Place the system unit on its front panel.
8. Install the four power-supply screws (see the figure below).
9. Tighten the four power-supply screws.



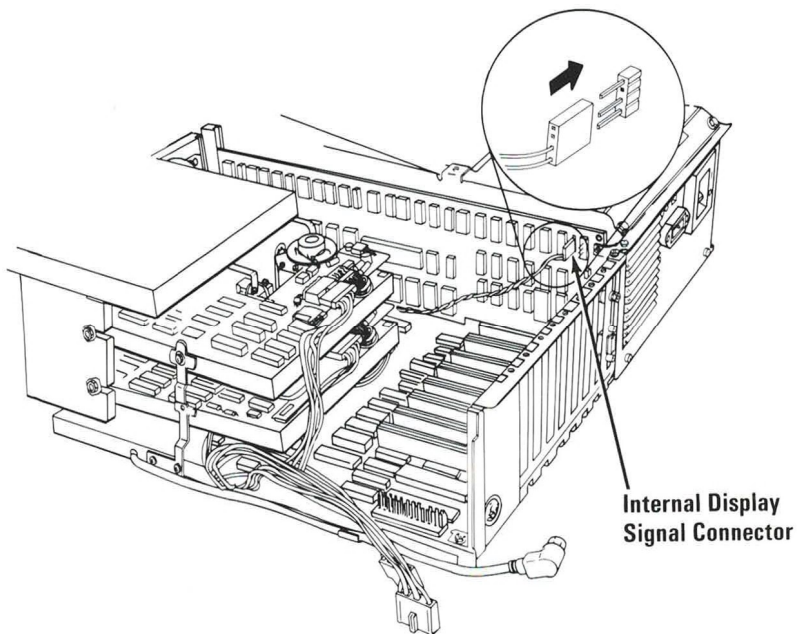
10. Connect the internal display's power connector P12, which is located in the cable raceway.
11. Install the cable raceway by sliding the cover under the slots and installing the screws.



12. Install the two screws **A** that hold the internal display to the frame (see the figure below) and tighten them.
13. Install the two internal-display mounting screws **B** and tighten them.

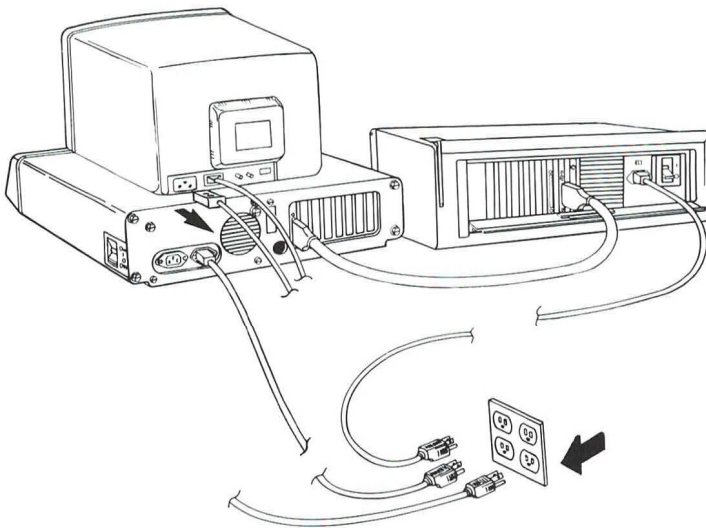


14. Place the system unit in its operating position.
15. Install the option adapters. (1096)
16. Install the Diskette Drive Adapter. (1091)
17. Install the Color/Graphics Monitor Adapter. (1086)
18. Connect the internal display's signal connector to the Color/Graphics Monitor Adapter (see the figure below).
19. Install the system unit's cover. (1006)



IBM Color Display Removal 1070

1. Set the system unit's and color display's Power switches to Off.
2. Unplug the color display's power cord from the wall outlet.
3. Disconnect the signal cable from the rear of the Color/Graphics Monitor Adapter.
4. Disconnect the color display's power cord from the rear of the display.



IBM Color Display Replacement 1071

1. Connect the color display's signal cable to the rear of the Color/Graphics Monitor Adapter.
2. Connect the color display's power cord to the rear of the display.
3. Plug the color display's power cord into the wall outlet.

Color Trimmer Capacitor Adjustment

Note: This adjustment is effective for composite color displays only.

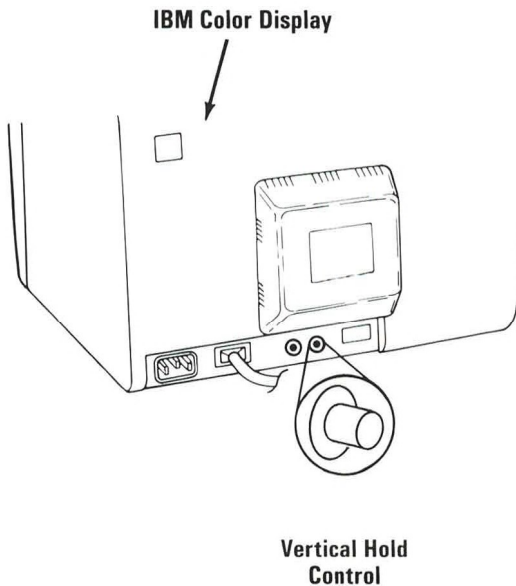
If your display works correctly except for an incorrect color or the absence of color, adjust the trimmer capacitor on the system board as follows:

1. Remove the system unit's cover. (1005)
2. Find the color trimmer capacitor (see "System Board" in Section 4).
3. Using a small non-metallic screwdriver, adjust the trimmer capacitor in small increments until the color is correct.
4. Adjust the hue and color controls on the display.

Vertical Hold Adjustment

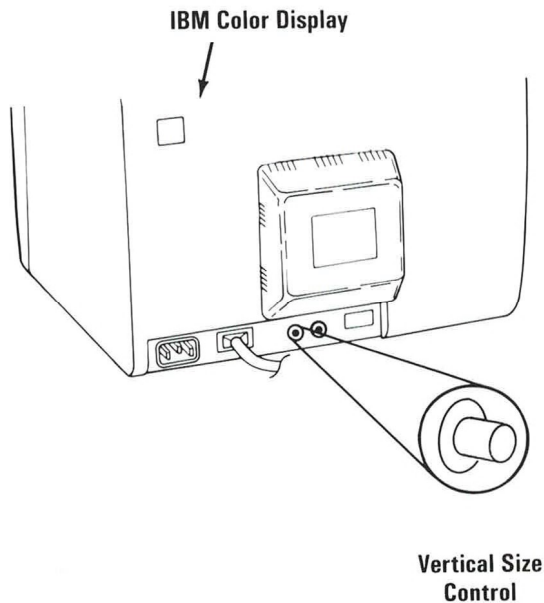
If your IBM Color Display has a Vertical Hold problem (screen is rolling), adjust the Vertical Hold control as follows:

1. Set the color display's Power switch to On.
2. Set the system unit's Power switch to On.
3. Wait for the completion of the POST.
4. Turn the Vertical Hold control clockwise as far as it will go.
5. Turn the Vertical Hold control counterclockwise until the screen stops rolling and is steady.



Vertical Size Adjustment

1. Set the system unit's Power switch to Off.
2. Set the color display's Power switch to On.
3. Turn the Brightness and Contrast controls fully clockwise.
4. Turn the Vertical Size control fully counterclockwise. A black area will appear across the top and bottom of the screen.
5. Turn the Vertical Size control clockwise until both black areas just disappear.
6. Adjust the Brightness and Contrast controls for eye comfort.

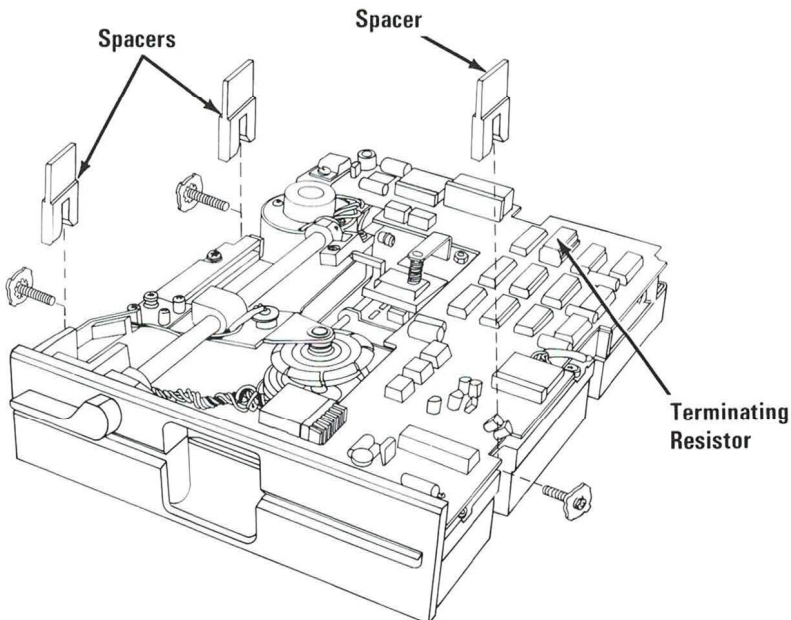


Diskette Drive

Diskette Drive Removal 1075

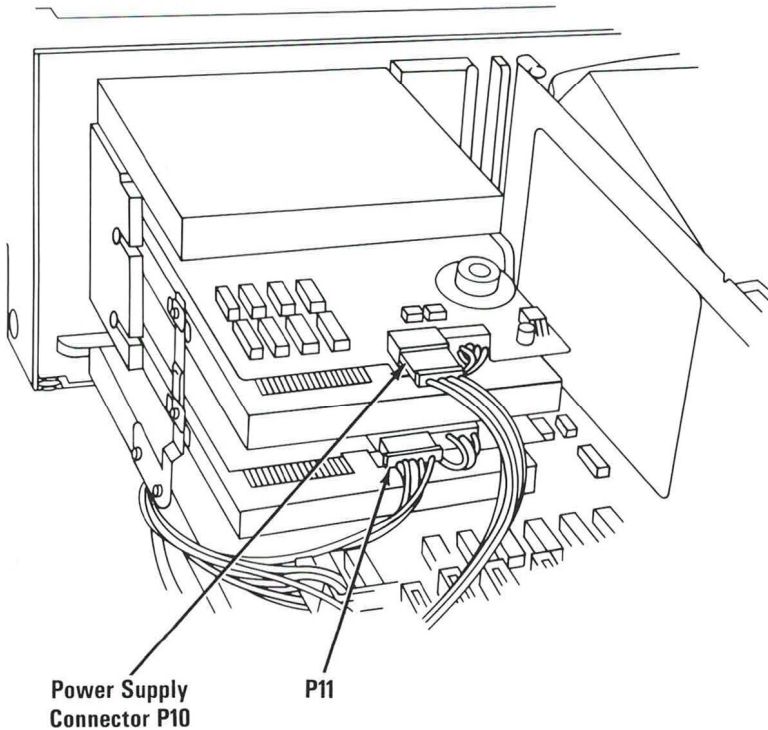
Notes:

1. If your system has only one diskette drive, a blank insert will appear in the position of diskette drive B.
2. This procedure may be used to remove either diskette drive A or diskette drive B. If removing diskette drive B, diskette drive A must always be removed first.
3. Drive A should always have a terminating resistor installed. If installing a new drive A, be sure a terminating resistor is installed on it.
4. The three-diskette drive mounting spacers must always be installed as shown in the figure below.

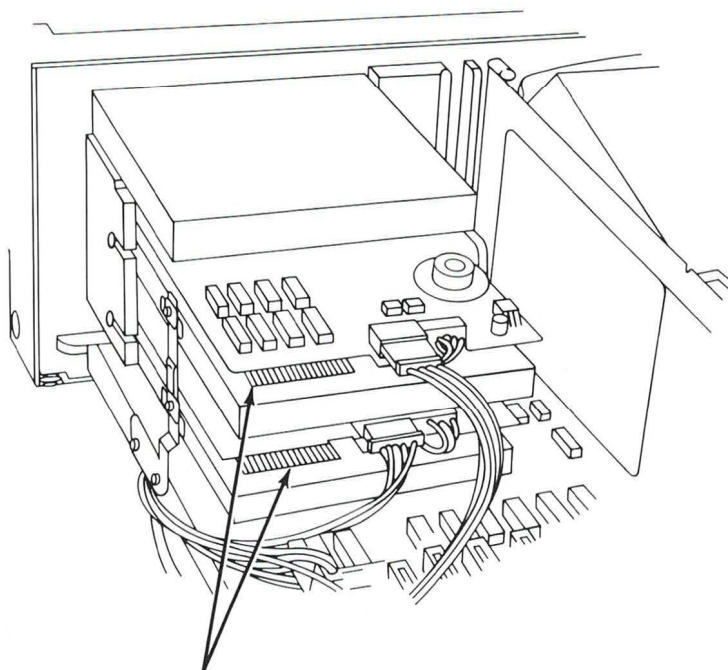


1. Remove the system unit's cover. (1005)
2. Remove the option adapters. (1095)
3. Remove the Diskette Drive Adapter. (1090)
4. Find the position of power supply connector P10 and P11, if drive B is installed, and disconnect it.

Warning: Do not pull on the wires when disconnecting connectors.

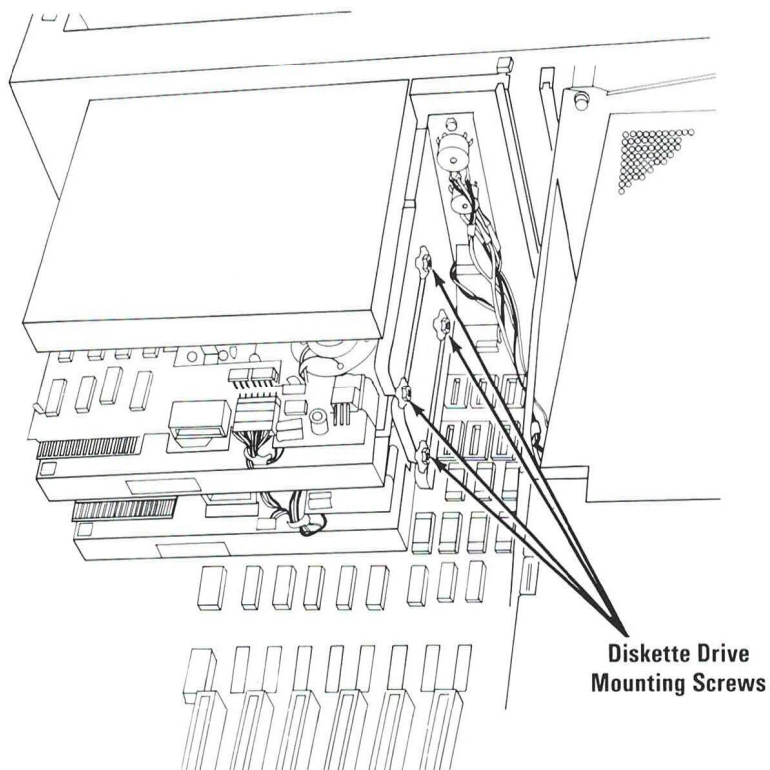


5. Remove the signal connectors from the back of the diskette drives.

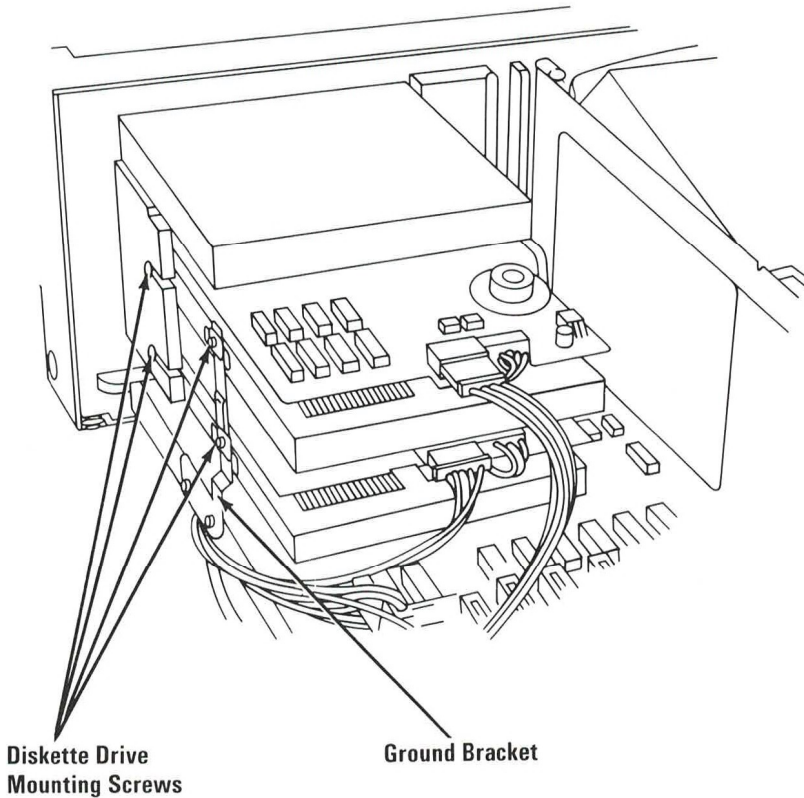


**Signal Connectors
(Cable Removed)**

6. Loosen, but do not remove, the two mounting screws on the left side of the diskette drive (looking from the front of the system unit).



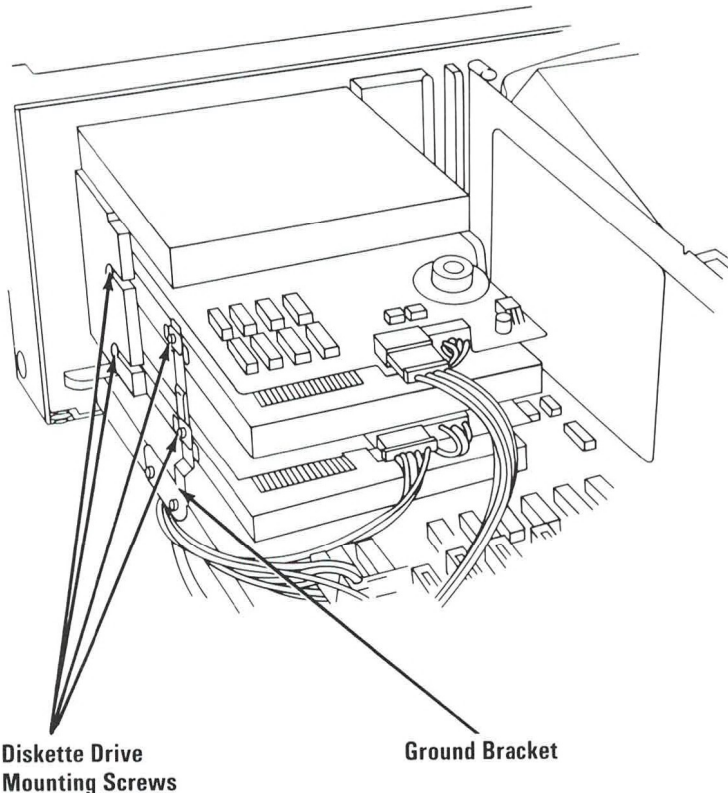
7. Remove the two mounting screws on the right side of the diskette drive.
8. Remove the two screws holding the diskette-drive ground bracket and remove the bracket.
9. Remove the diskette drive by sliding it to the rear.



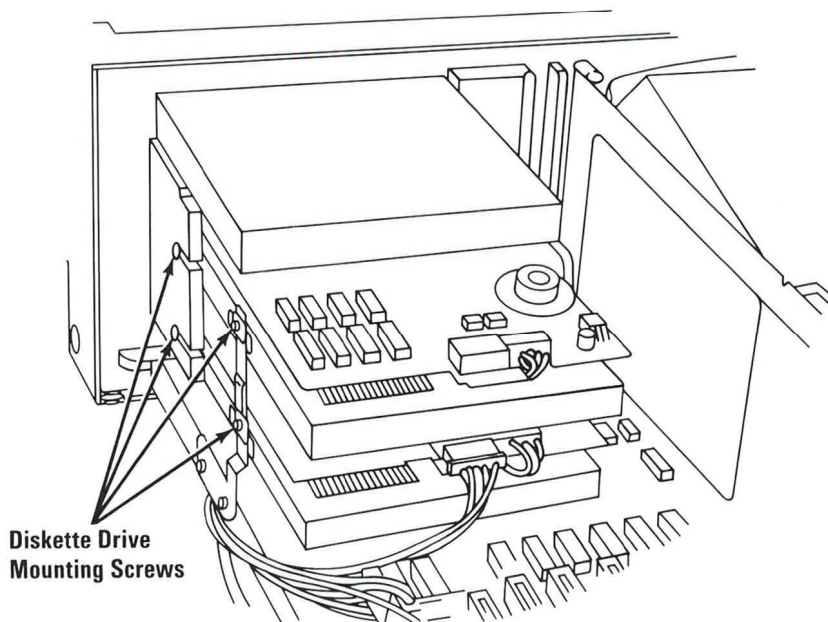
Diskette Drive Replacement 1076

Note: This procedure can be used to install either diskette drive A or diskette drive B. If drive B was removed, you must install it first. Ensure that the terminating resistor is installed on drive A only.

1. Looking from the front of the diskette drive, install, but do not tighten, the mounting screws on the left side of the diskette drive and the front mounting screw on the right side of the diskette drive. Slide the three mounting spacers over the screws and position them in the recesses provided.
2. Slide the diskette drive into the system unit from the rear.
3. Install the diskette-drive ground bracket.
4. Install the mounting screws on the right side of the diskette drive.



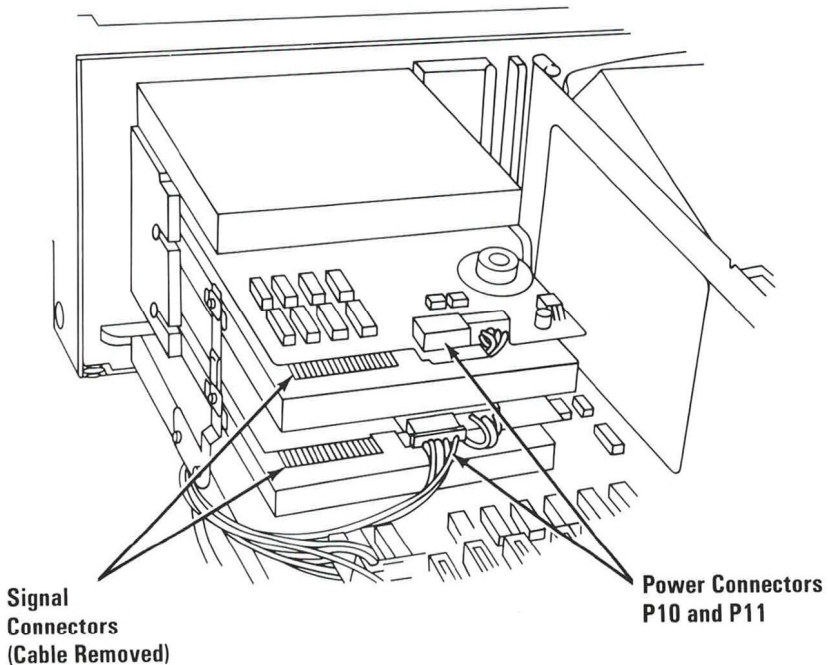
5. Align the diskette drive so it is flush with the system unit's front panel, then tighten the diskette-drive mounting screws.



6. Connect power connector P10 (and P11, if drive B is installed).
7. Install the signal connector(s).

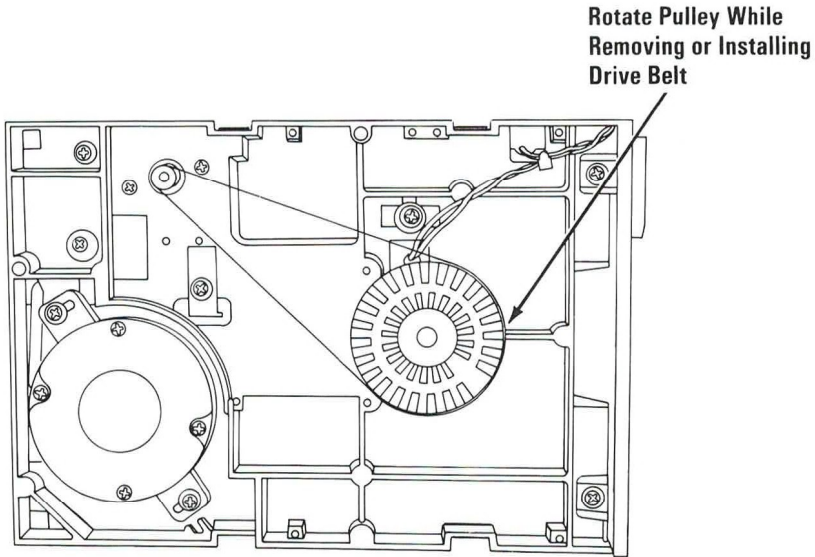
Note: The end connector on the signal connector cable must always be installed on diskette drive A.

8. Install the Diskette Drive Adapter. (1091)
9. Install any option adapter removed earlier. (1096)
10. Install the system unit's cover. (1006)



Drive Belt Removal 1080

1. Remove the system unit's cover. (1005)
2. Remove the diskette drive to be worked on. (1075)
3. Carefully place the diskette drive on the work surface with the drive belt and pulleys facing up.
4. Lift the belt from the large pulley, then lift it from the small pulley.



Drive Belt Replacement 1081

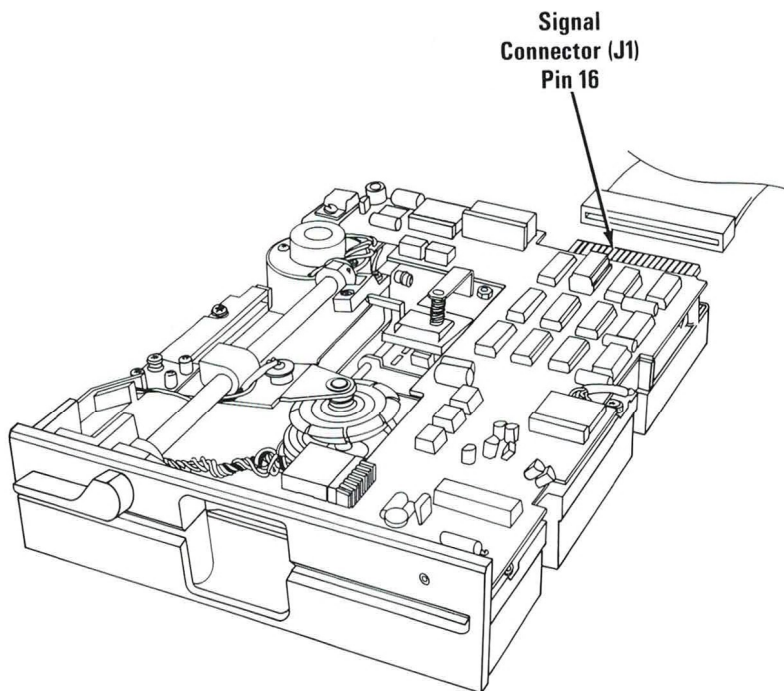
1. Place the drive belt around the small pulley (dark shiny side facing pulleys), then place the belt around the large pulley by rotating the large pulley while installing the drive belt.
2. Install the diskette drive. (1076)
3. Install the system unit's cover. (1006)
4. Connect the system cables.

Drive-Motor Preliminary Speed Adjustment

Note: Make this adjustment for diskette drive A or B, or both, when the Advanced Diagnostics diskette will not load or the speed test will not execute. You will need a fluorescent light for this adjustment.

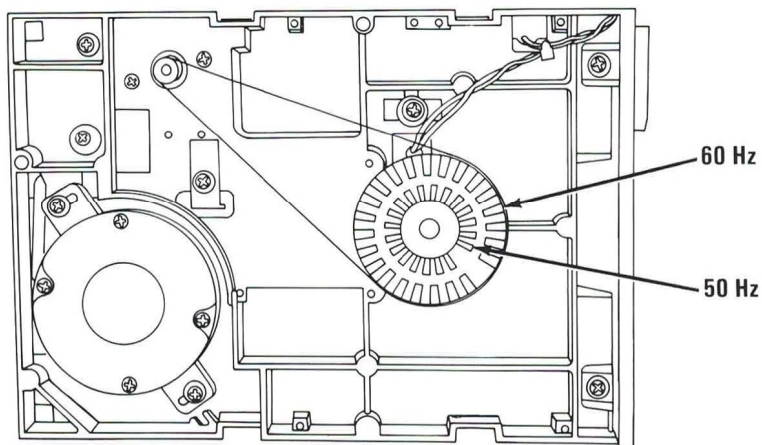
1. Remove the diskette drive. (1075)
2. Insert a scratch diskette into the diskette drive.
3. Place the diskette drive on the right side of the system unit so the bottom of the diskette drive can be seen.
4. Plug the power connector and the signal connector into the diskette drive's printed circuit board, and leave the signal cable unplugged.
5. Connect the system unit's power cord, then plug it into a wall outlet.
6. Set the system unit's Power switch to On.

7. Install a jumper between J1 pin 16 and ground to start the drive motor spinning (see the figure below).



8. Using a fluorescent light, observe the black strobe marks on the outer ring of the drive pulley and adjust the variable resistor on the printed circuit board until the strobe marks appear to stand still.

Note: The outer ring of strobe marks is for 60 hertz and the inner ring is for 50 hertz.



9. Set the system unit's Power switch to Off.
10. Disconnect the system unit's power cord from the wall outlet.
11. Install the diskette drive. (1076)
12. Do the "Drive Motor Speed Adjustment" procedure next to verify that the speed is within specification. Adjust if necessary.
13. Install the system unit's cover. (1006)
14. Connect all cables.

Drive Motor Speed Adjustment

1. Insert the Advanced Diagnostics diskette.
2. Set the Power switch on the expansion unit (if attached) and the system unit to On.
3. Advance to the Diskette Drive and Adapter diagnostic menu (see Section 2).
4. Insert a formatted scratch diskette into the drive being tested.
5. Select option 4 (**SPEED TEST**) for the diskette drive you are testing. The diskette drive's speed and the adjustment specification appear on the screen.

Note: If you are unable to load the Advanced Diagnostics diskette, or if the speed test will not execute, see the "Drive-Motor Preliminary Speed Adjustment".

SPEED IS 2000

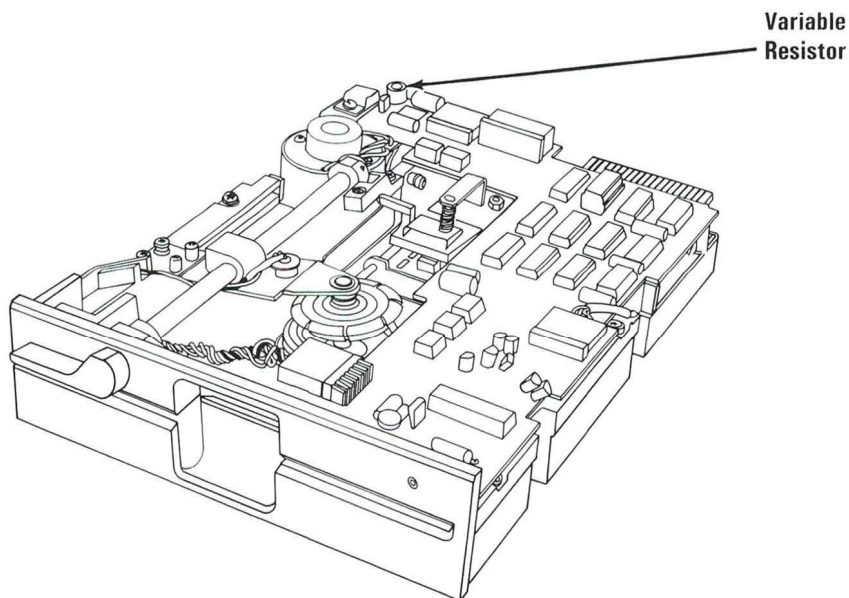
**ADJUST FOR 1970 TO 2030
PRESS ANY KEY TO EXIT**

SPEED IS 1999

ADJUST FOR 1970 TO 2030

6. Set the Power switch on the system unit (and expansion unit, if attached) to Off.
7. Unplug the system unit's (and expansion unit's) power cord from the wall outlet.
8. Disconnect all cables from the rear of the system unit.
9. Remove the system unit's cover. (1005)
10. Remove the diskette drive that needs adjusting. (1075)
11. Place the diskette drive on the right side of the system unit so the printed circuit board is accessible.
12. Connect the diskette drive's power cable and signal cable.
13. Insert the Advanced Diagnostics diskette.
14. Set the Power switch on the system unit to On.
15. Advance to the Diskette Drive and Adapter diagnostic menu (see Section 2).
16. Insert a formatted scratch diskette.

17. The variable resistor, on the printed circuit board, is the adjustment for the diskette drive's speed. To adjust the speed, carefully insert a screwdriver in the adjusting screw on the top of the variable resistor.



18. Turn the screw until the speed shown on the screen is within the required specifications (see the figure below).
19. Set the Power switch on the system unit to Off.
20. Install the diskette drive. (1076)
21. Install the system unit's cover. (1006)
22. Connect all cables.

SPEED IS 2000

**ADJUST FOR 1970 TO 2030
PRESS ANY KEY TO EXIT**

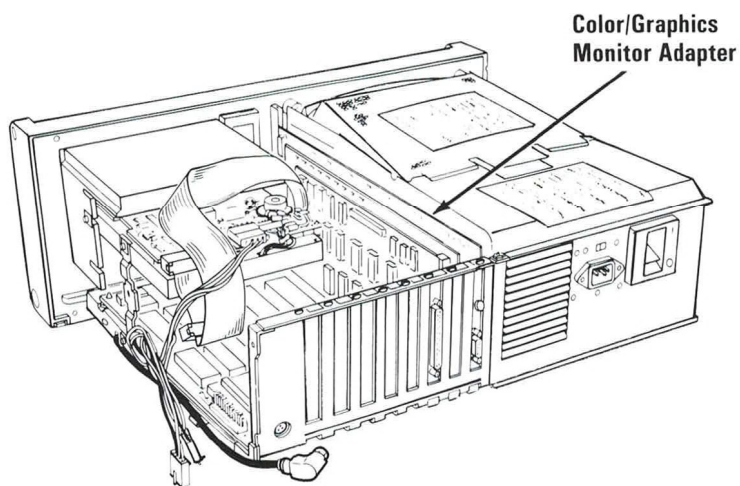
SPEED IS 1999

ADJUST FOR 1970 TO 2030

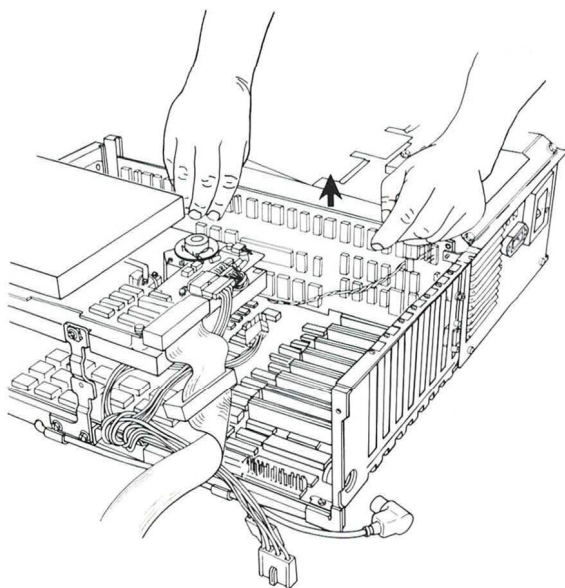
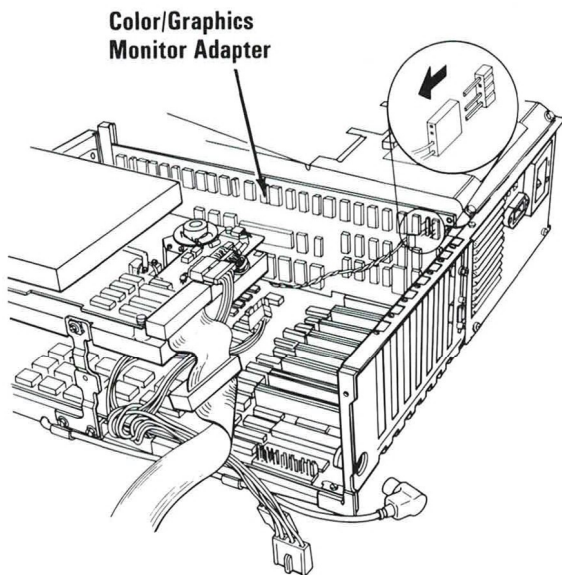
Option Adapters

Color/Graphics Monitor Adapter Removal 1085

1. Set the Power switch on the system unit to Off.
2. Unplug the system unit's power cord from the wall outlet and disconnect all cables from the rear of the system unit.
3. Remove the system unit's cover. (1005)
4. Remove the Color/Graphics Monitor Adapter mounting screw.

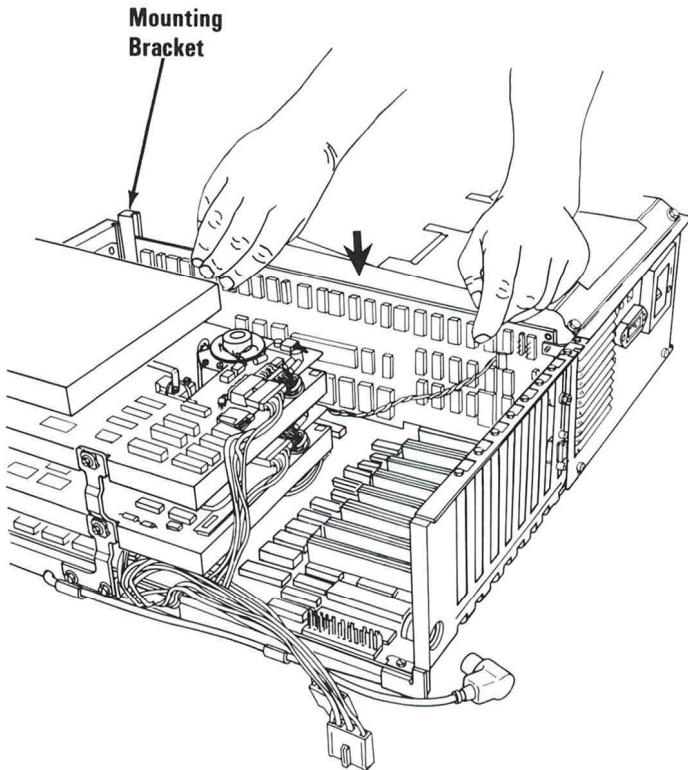


5. Remove the internal display's signal connector from the Color/Graphics Monitor Adapter.
6. Grasp the Color/Graphics Monitor Adapter by the top edge and lift straight up.

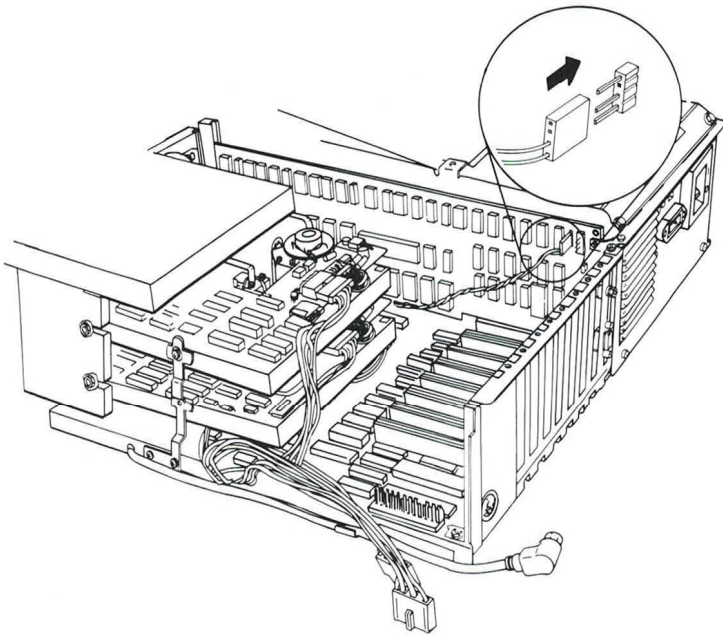


Color/Graphics Monitor Adapter Replacement 1086

1. Insert the Color/Graphics Monitor Adapter into slot 1 of the system board. Press down firmly on the Color/Graphics Monitor Adapter to ensure a good connection.

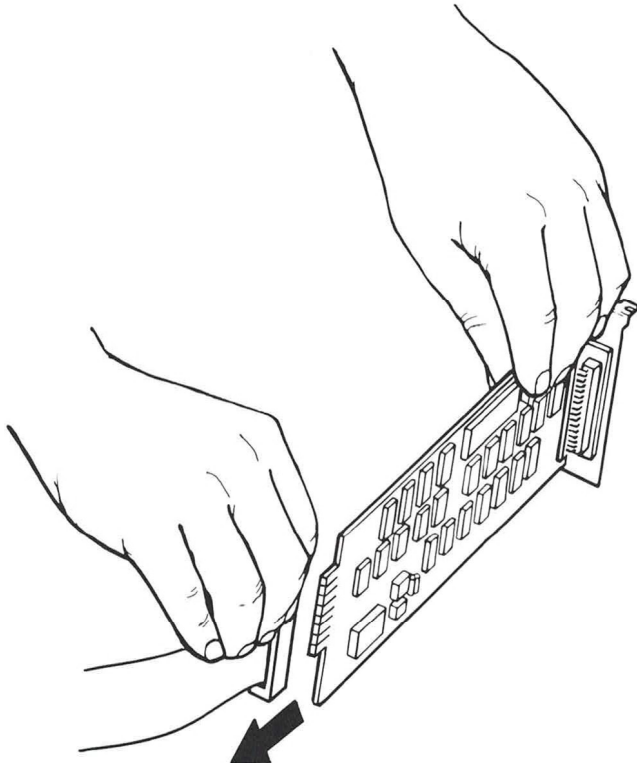


2. Connect the internal display's signal connector to the Color/Graphics Monitor Adapter, as shown below.
3. Install the Color/Graphics Monitor Adapter mounting screw.
4. Replace the system unit's cover. (1006)



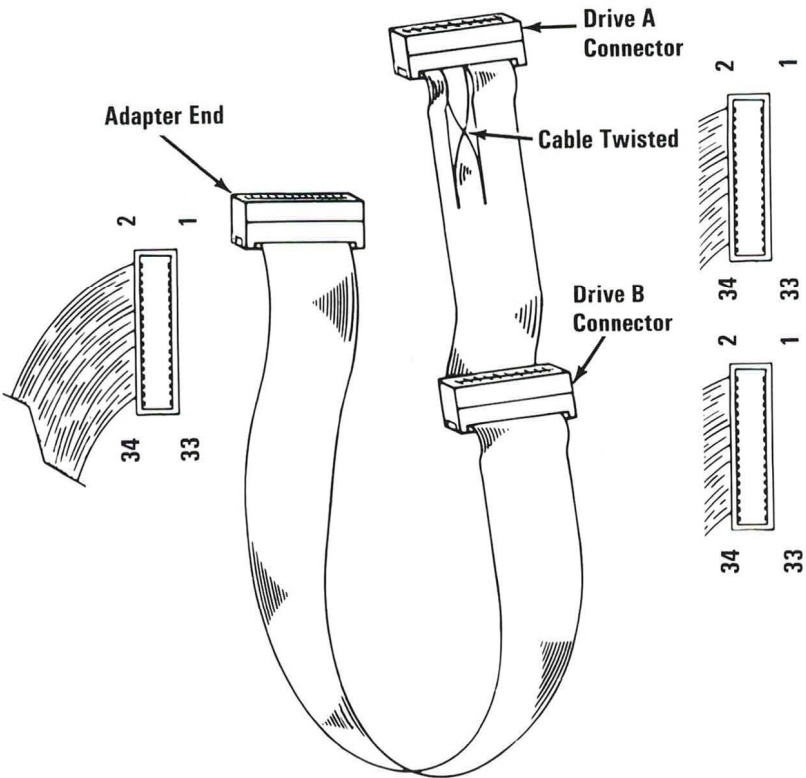
Diskette Drive Adapter Removal 1090

1. Set the Power switch on the system unit to Off.
2. Unplug the system unit's power cord from the wall outlet and disconnect all cables from the rear of the system unit.
3. Remove the system unit's cover. (1005)
4. Remove the Diskette Drive Adapter mounting screw.
5. Grasp the Diskette Drive Adapter by the top edge and lift straight up.
6. Disconnect the signal cable from the Diskette Drive Adapter.

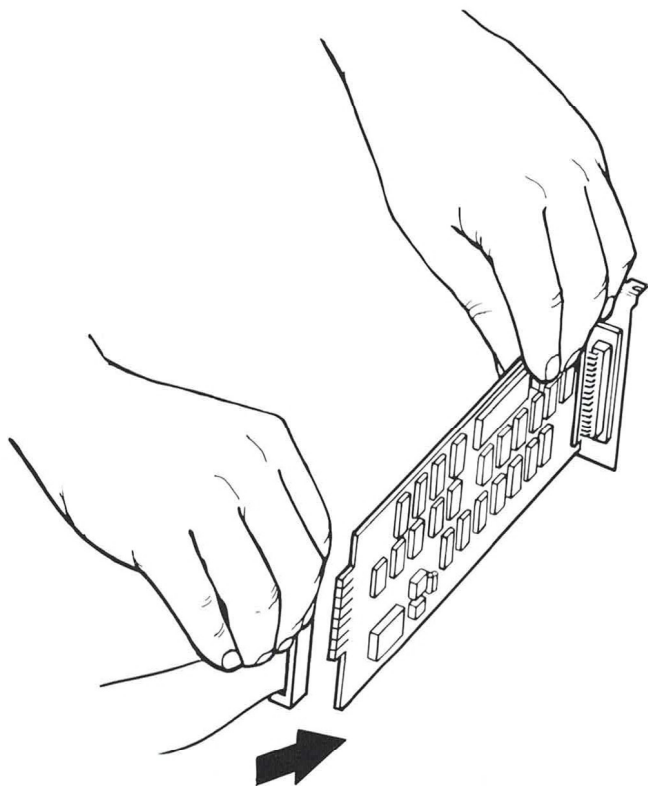


Diskette Drive Adapter Replacement 1091

- 1. Look at the figure below and familiar yourself with the signal cable before installing the connector.

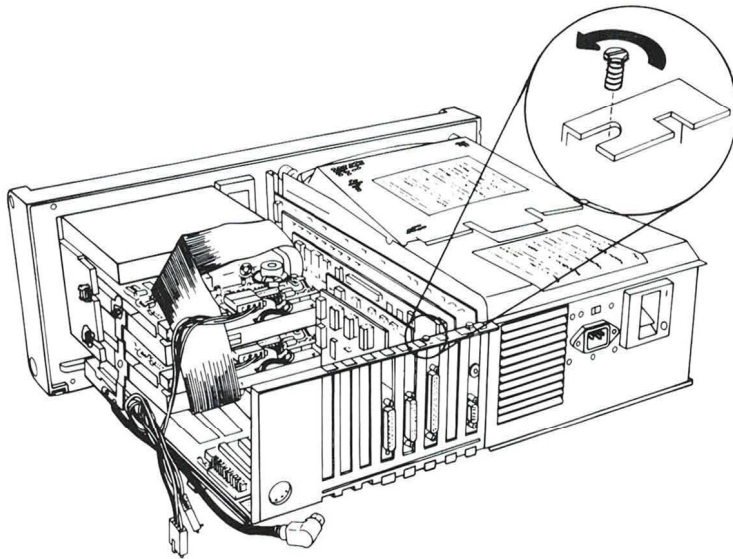


2. Connect the adapter end of the signal cable to the Diskette Drive Adapter.
3. Insert the Diskette Drive Adapter into slot 3 of the system board. Press down firmly on the adapter to ensure a good connection.
4. Install the Diskette Drive Adapter mounting screw.
5. Install the system unit's cover. (1006)

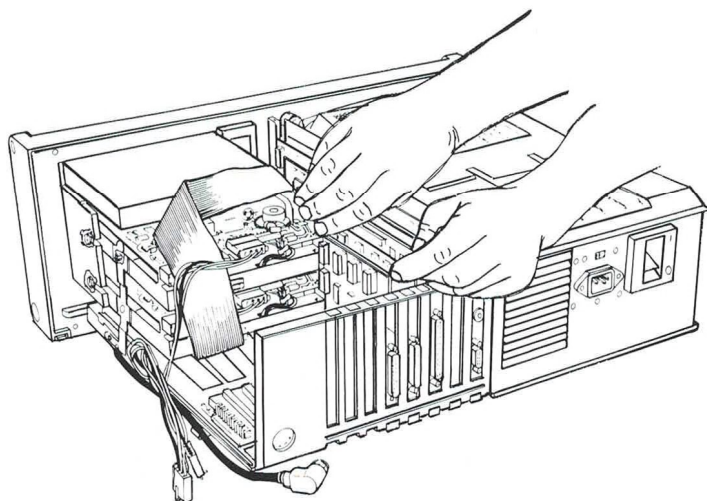


Option Adapter Removal 1095

1. Set the system unit's Power switch to Off.
2. Remove the system unit's cover. (1005)
3. Remove the option adapter mounting screw.

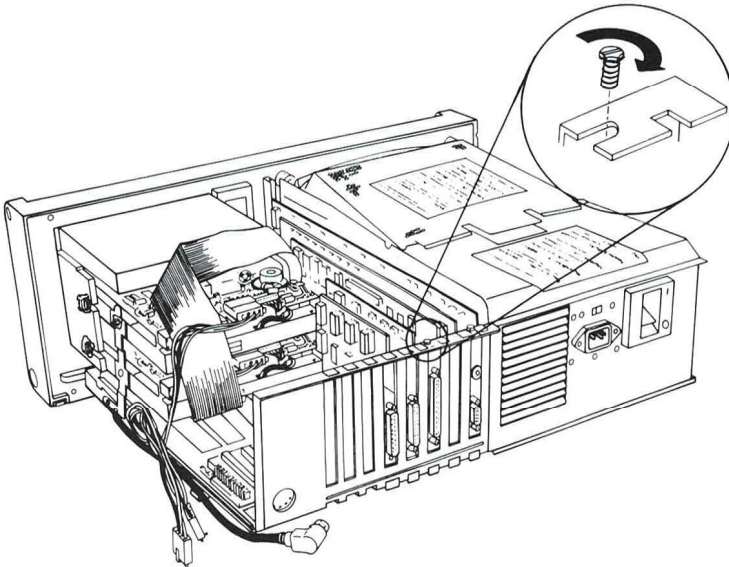


4. Grasp the option adapter by the top edge and lift straight up.



Option Adapter Replacement 1096

1. Install the option adapter into the option slot from which it was removed. Press down firmly on the adapter to ensure a good connection.
2. Install the adapter's mounting screw.
3. Install the system unit's cover. (1006)

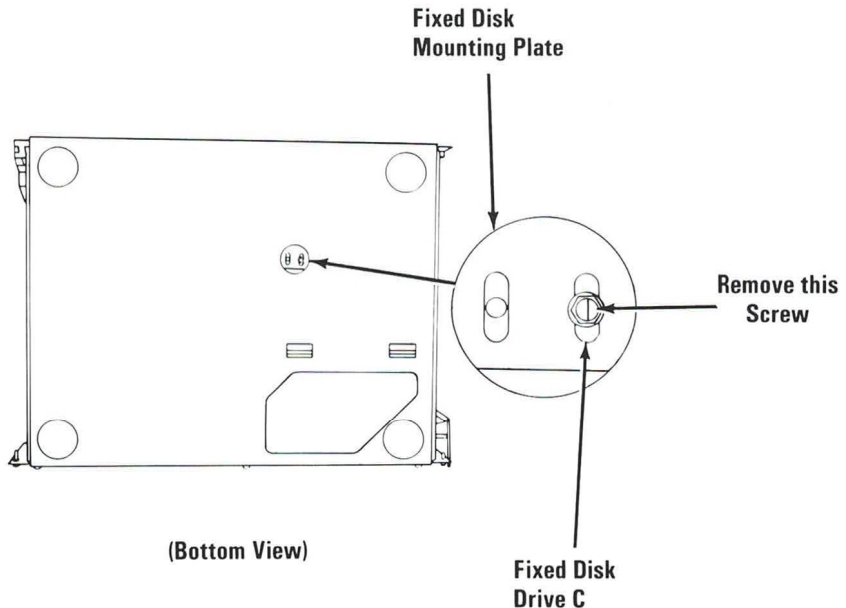


Fixed Disk Drive

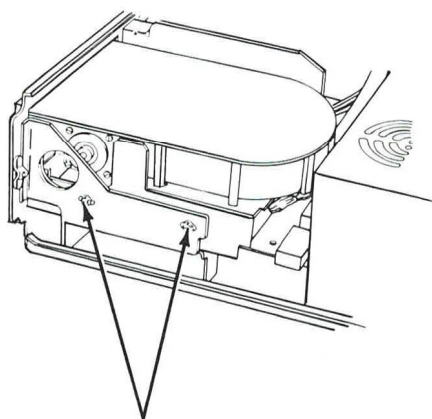
Drive C Removal 2000

Warning: Normal shipping and handling can result in permanent loss of all data and formatting on the fixed disk drives. We recommend that you back up all disk files on diskettes.

1. Set the Power switch on the system unit (and expansion unit, if attached) to Off.
2. Remove all cables from the rear of the expansion unit.
3. Remove the expansion unit's cover. (2015)
4. Tilt the unit up and remove the screw from the fixed disk drive's mounting plate, as shown below.



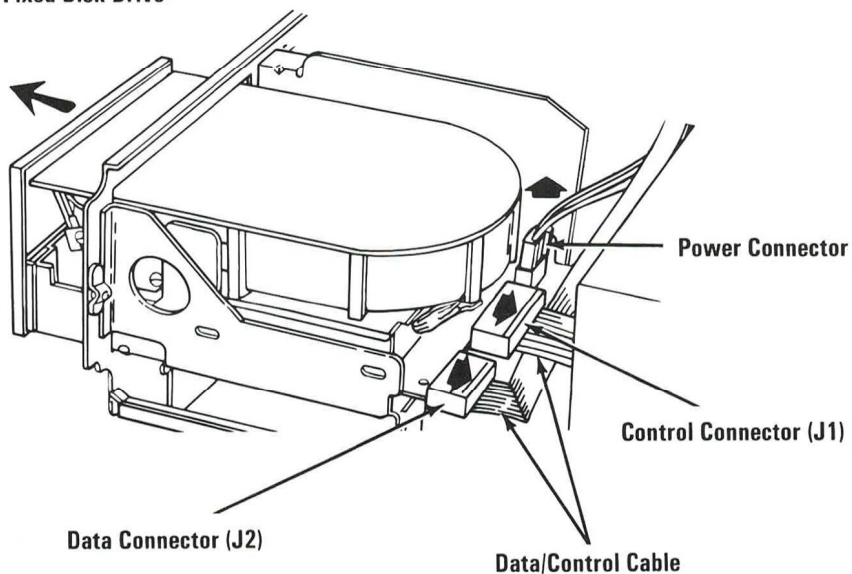
5. Remove the two mounting screws on the right side of the disk drive.

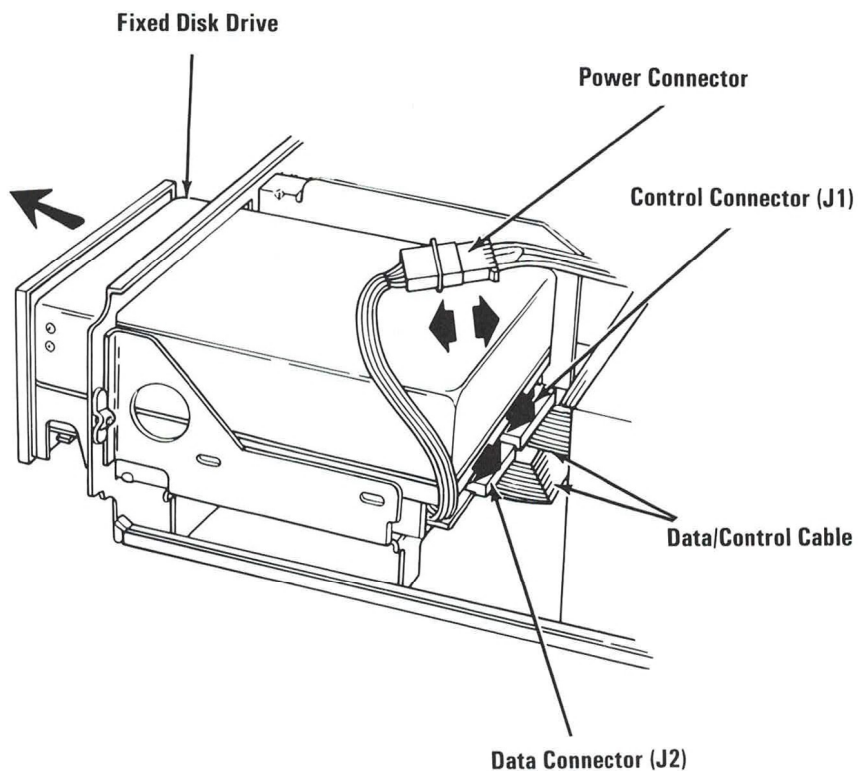


Mounting Screws

6. Disconnect the power connector, control connector (J1), and data connector (J2). Then slide the drive completely out of the unit.

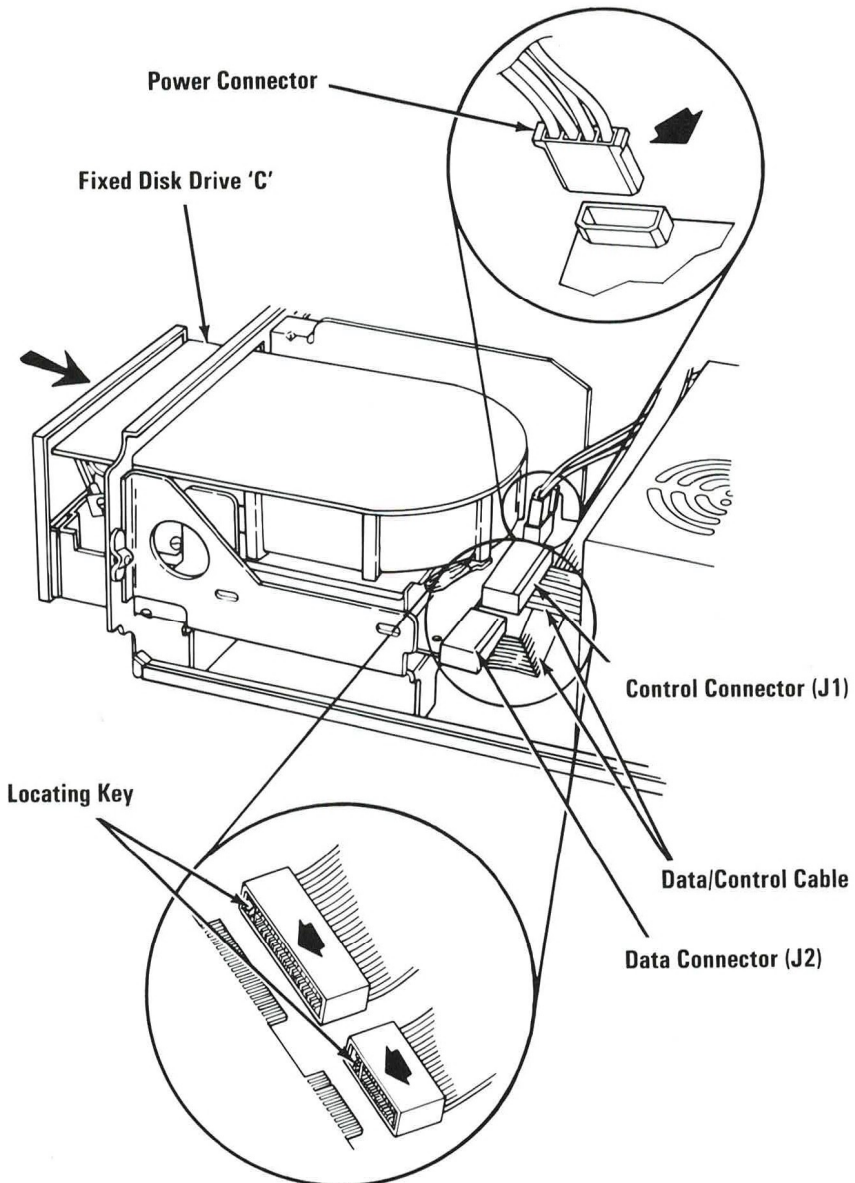
Fixed Disk Drive

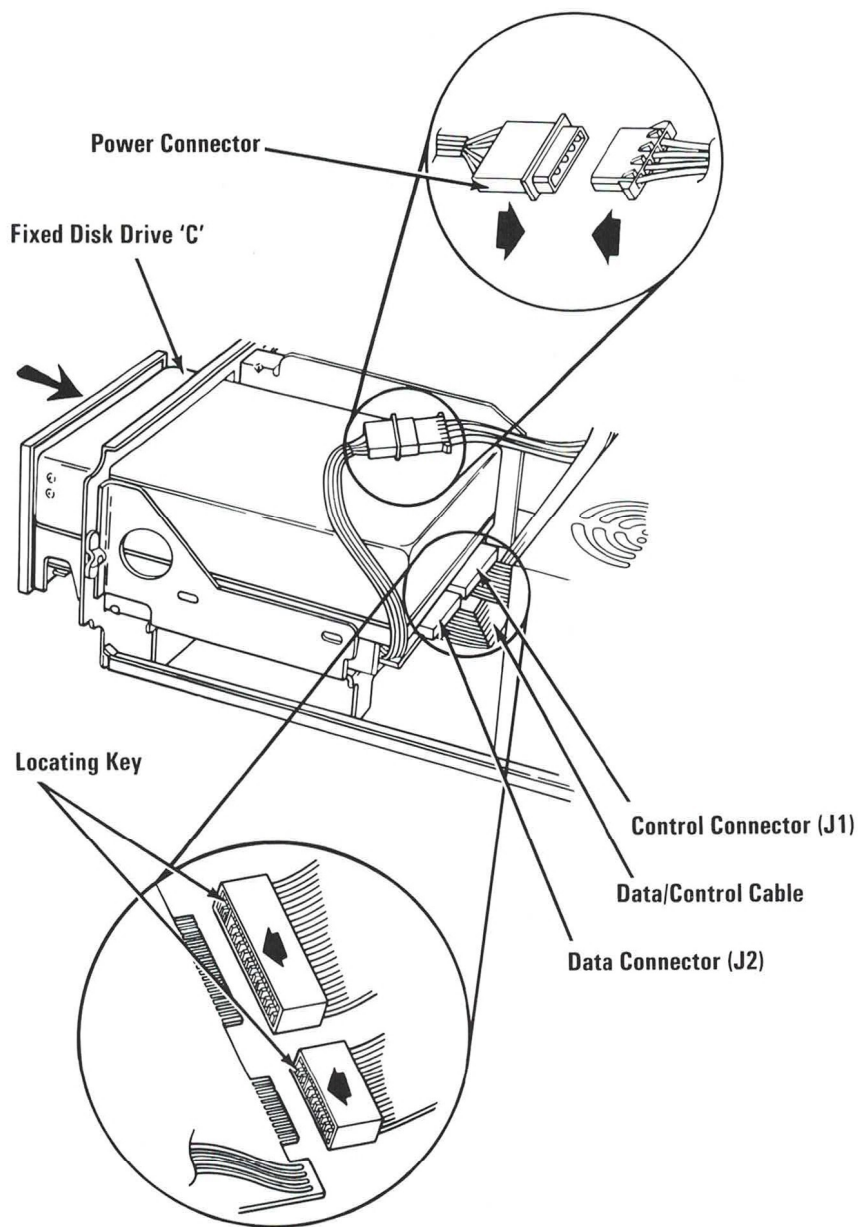




Drive C Replacement 2001

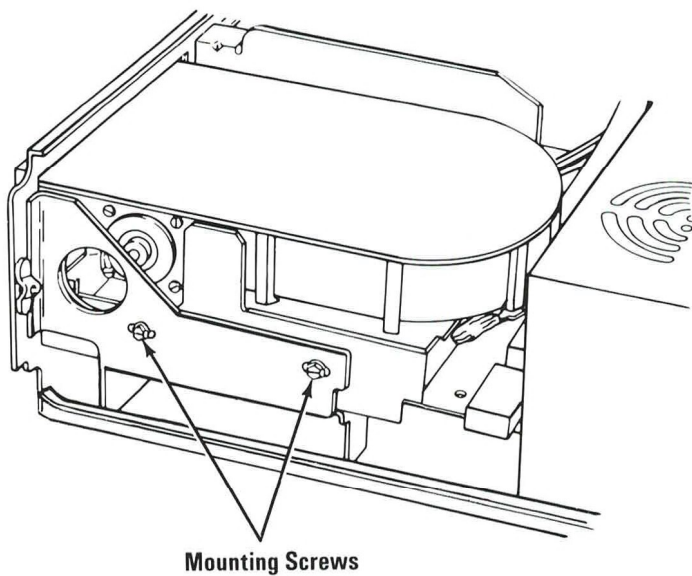
1. Slide the disk drive into slot "C", except for approximately 50 mm (2 in.), as shown below.
2. Plug in the power connector, control connector (J1), and data connector (J2).





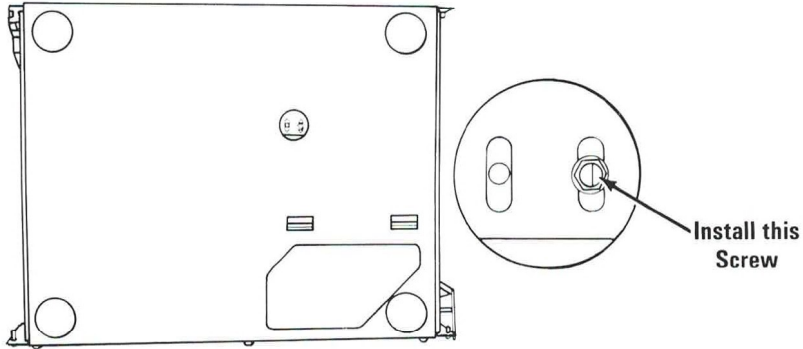
3. Slide the disk drive in until a clearance of 1 mm (0.040 in.) remains between the front mounting panel and the drive's faceplate.
4. Install the disk drive's mounting screws.

Warning: Be sure to use the same two mounting screws (long screws) you removed from the side of the drive, or damage to the drive will result.



5. Tilt the unit up and install the screw for the fixed disk drive's mounting plate as shown below.

Warning: Be sure to use the same screw (short screw) you removed from the mounting plate, or damage to the drive will result.

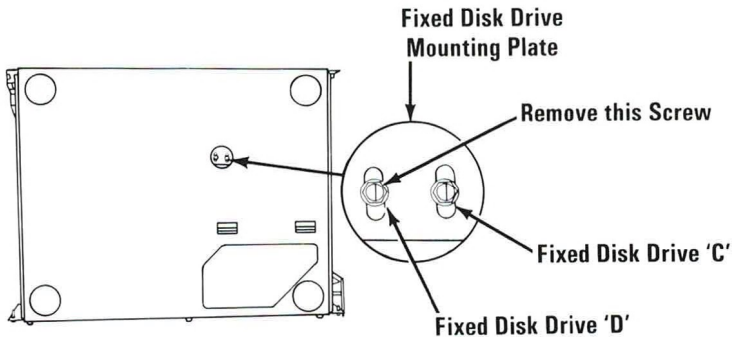


6. Install the expansion unit's cover. (2016)
7. Reconnect the cables to the expansion unit.

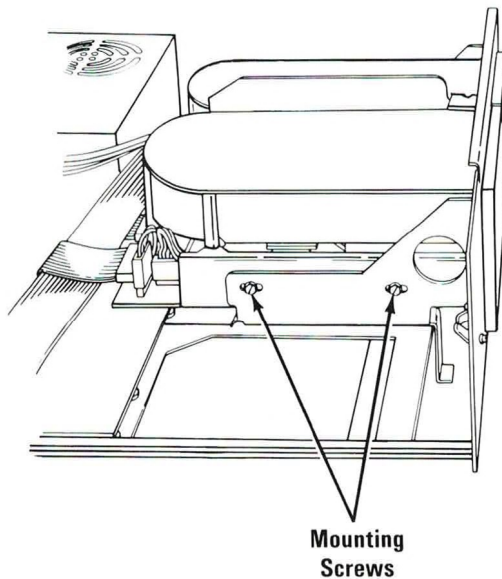
Drive D Removal 2005

Warning: Normal shipping and handling can result in permanent loss of all data and formatting on the fixed disk drives. We recommend that you back up all disk files on diskettes.

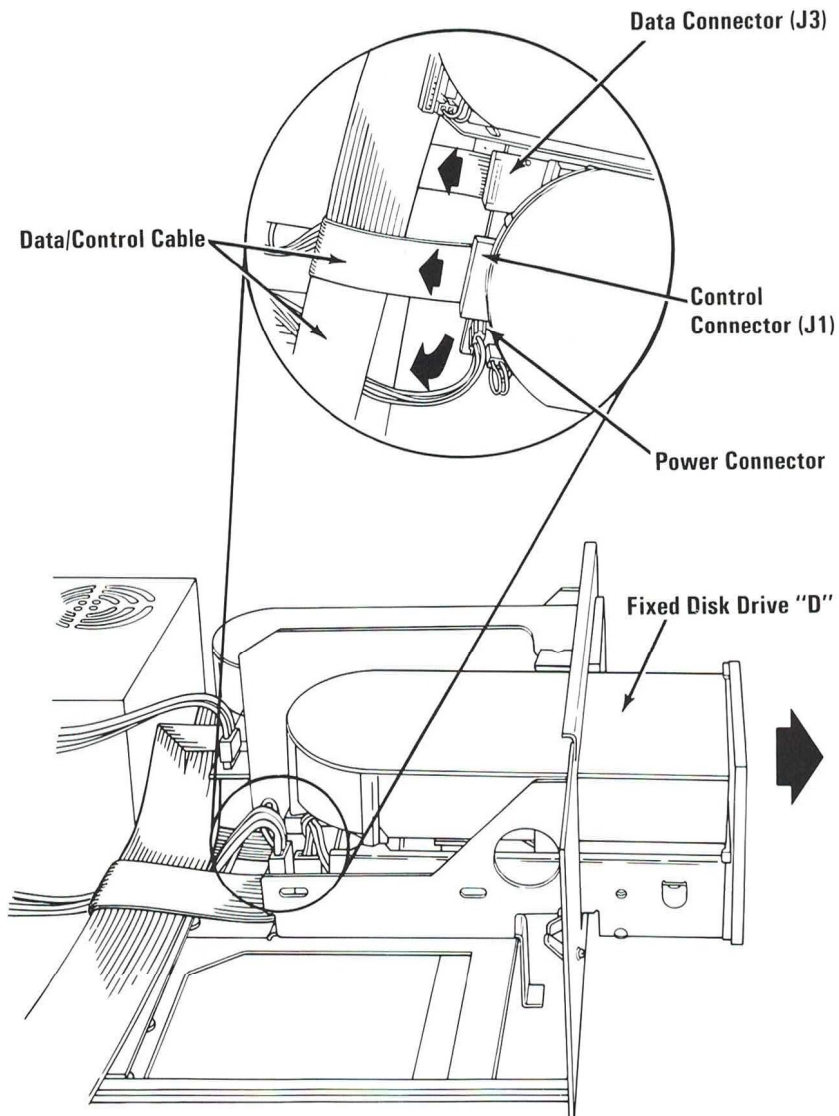
1. Remove the expansion unit's cover. (2015)
2. Tilt the unit up and remove the screw from the mounting plate for disk drive D.

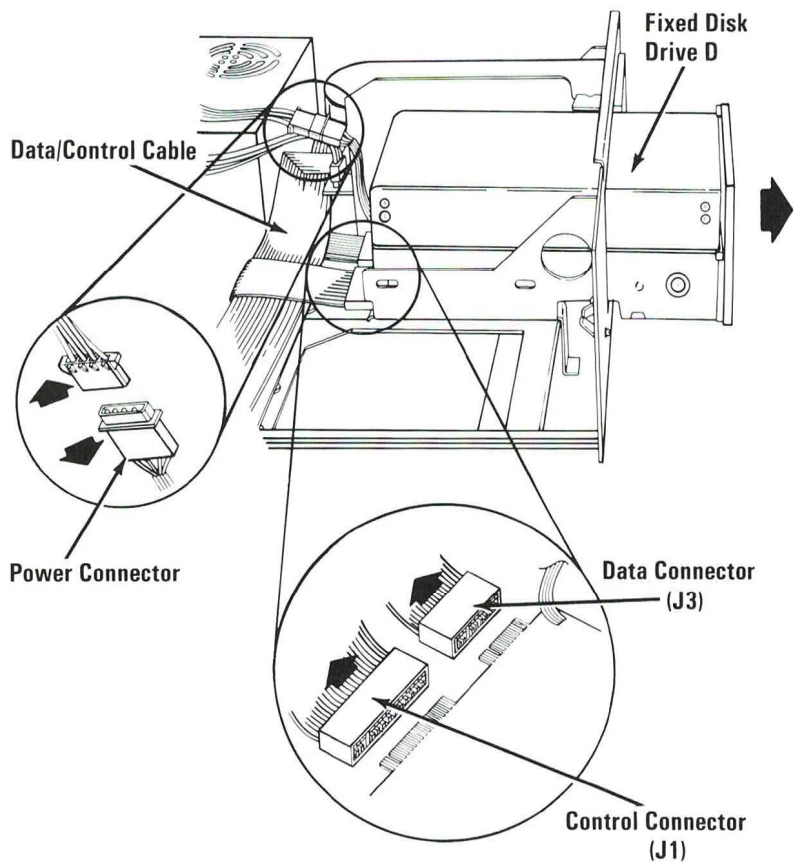


3. Remove all option adapters. (2025)
4. Remove the mounting screws on the left side of disk drive D.



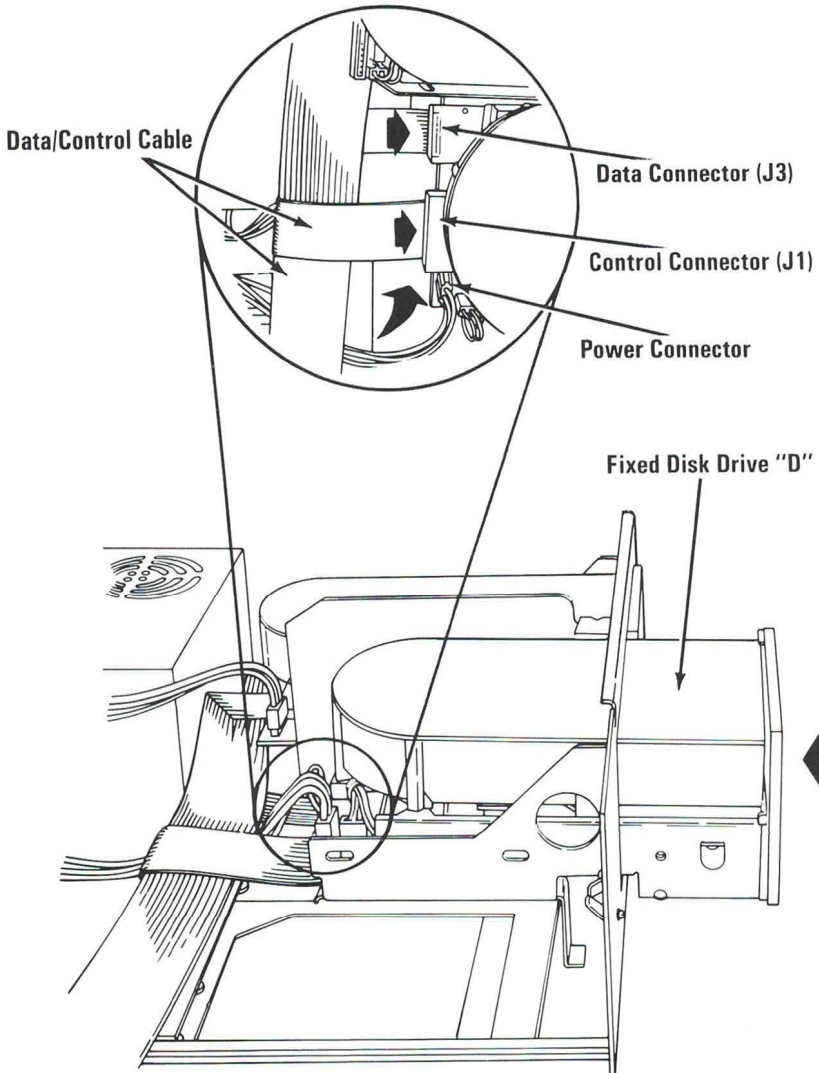
5. Slide the drive 50 mm (2 in.) towards the front and unplug control connector (J1), data connector (J3), and the power connector.
6. Remove the disk drive from the expansion unit.

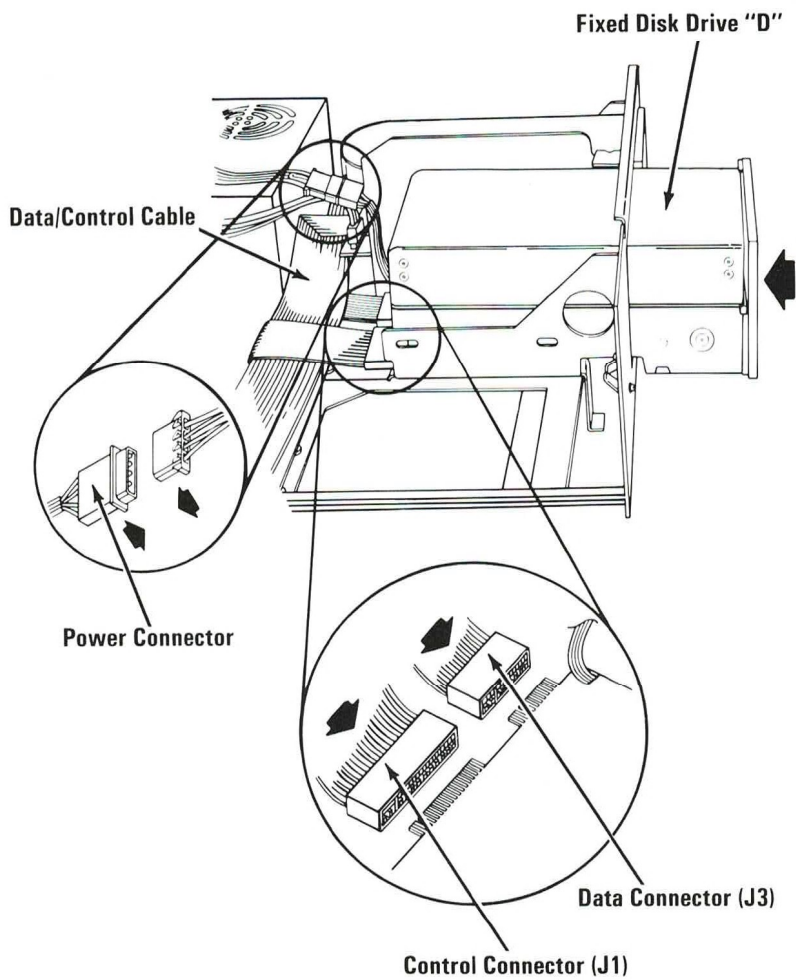




Drive D Replacement 2006

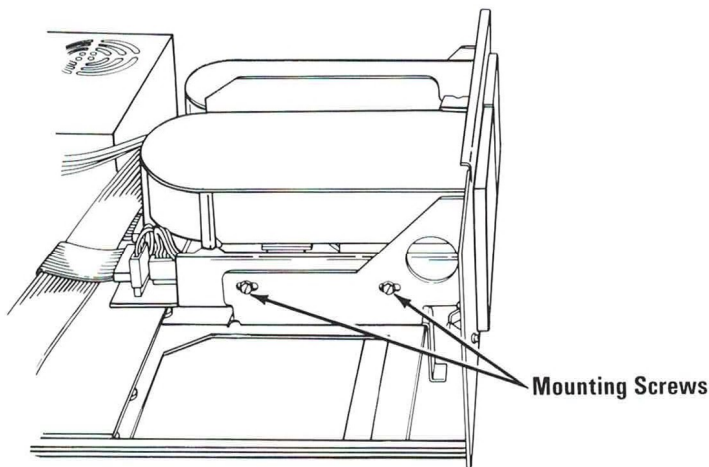
1. Slide the disk drive into slot "D", except for approximately 50 mm (2 in.) as shown below.
2. Plug in the power connector, control connector (J1), and data connector (J3).





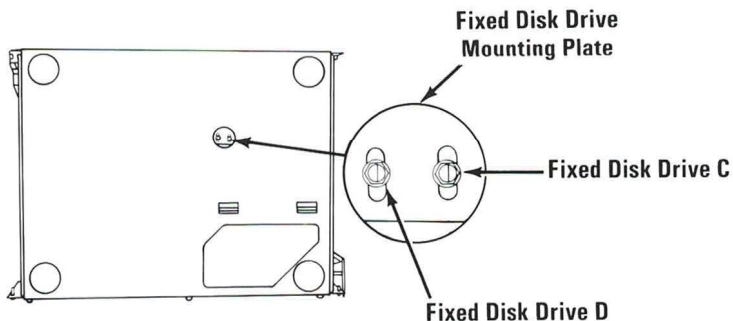
3. Slide the drive in until a clearance of 1 mm (0.040 in.) remains between the drive's faceplate and the front mounting panel.
4. Install the two mounting screws.

Warning: Be sure to use the same two mounting screws (long screws) you removed from the side of the drive, or damage to the drive will result.



5. Tilt the unit up and install the screw for the fixed disk drive's mounting plate, as shown below.

Warning: Be sure to use the same screw (short screw) you removed from the mounting plate, or damage will result.

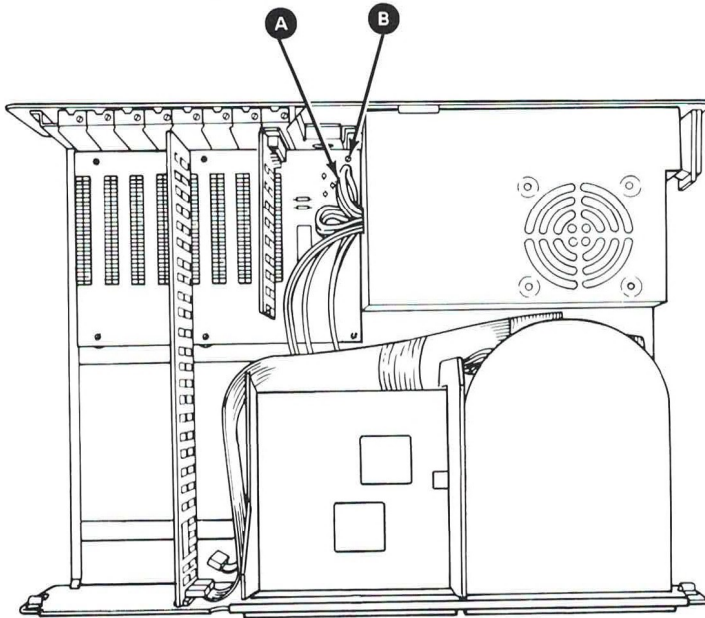


6. Install all option adapters. (2026)
7. Install the expansion unit's cover. (2016)
8. Connect the cables.

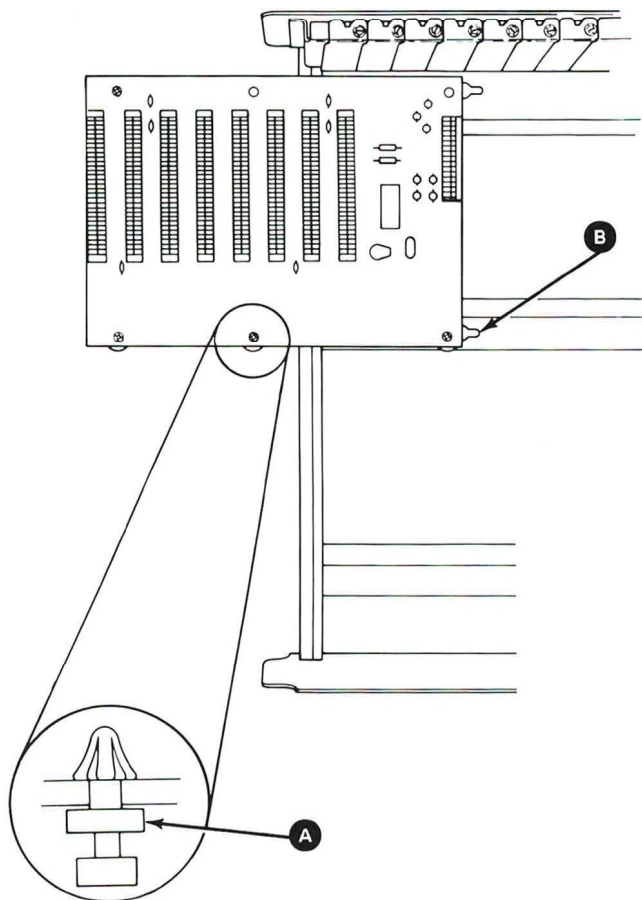
Expansion Unit

Expansion Board Removal 2010

1. Set the expansion unit's Power switch to Off, unplug the expansion unit's power cord, and disconnect all cables from the rear of the expansion unit.
2. Remove the expansion unit's cover. (2015)
3. Remove all option adapters, including the receiver card. (2025)
4. Remove the expansion board's power connectors **A**.
5. Remove the expansion board's mounting screw **B**.

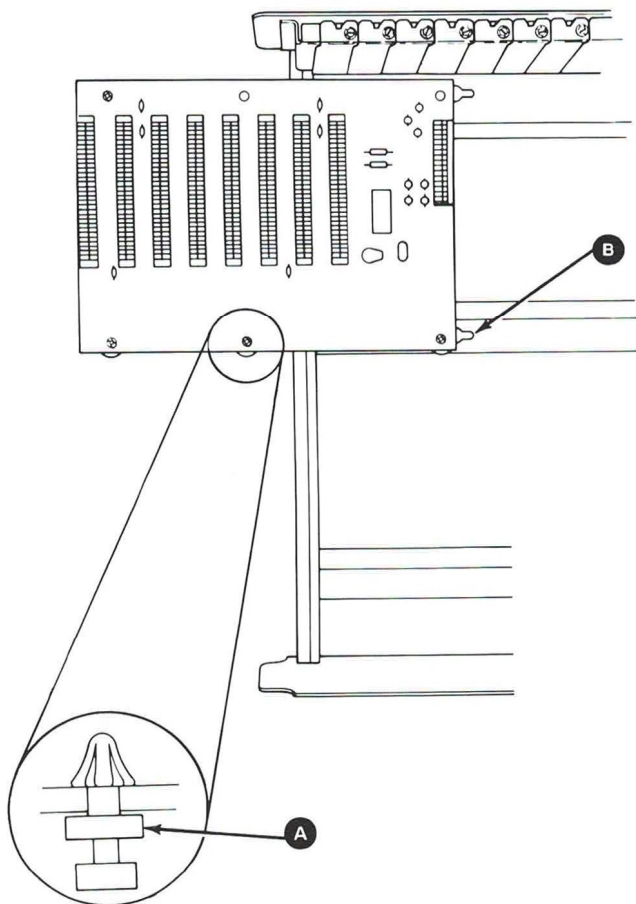


6. Slide the expansion board away from the power supply, approximately 25 mm (1 in.) until the standoffs **A** can be lifted from the mounting slots **B**.
7. Lift the expansion board up and out of the expansion unit.

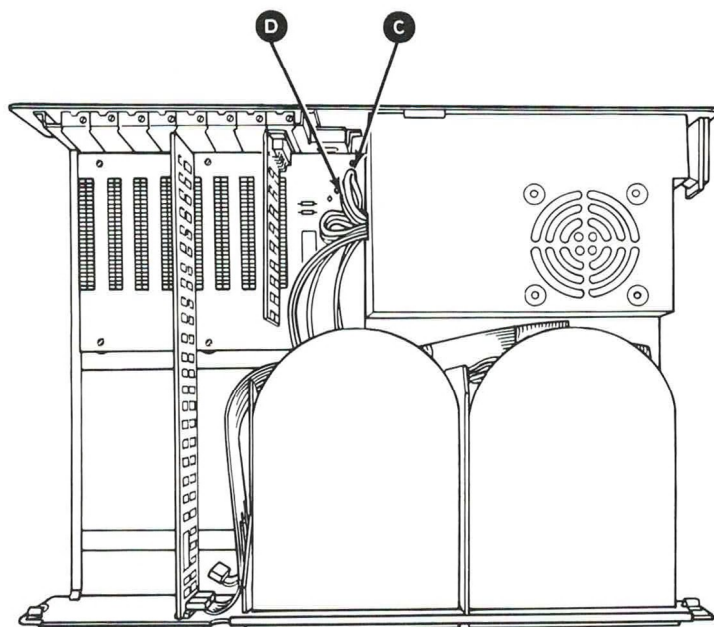


Expansion Board Replacement 2011

1. Insert the expansion board standoffs **A** into the mounting slots **B**.

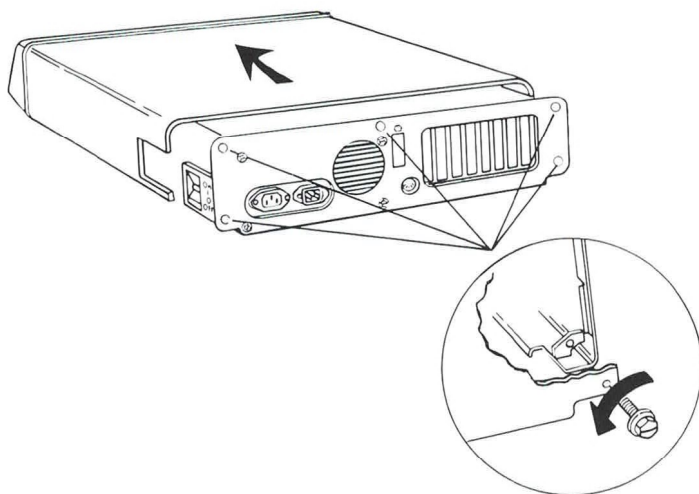


2. Slide the expansion board toward the power supply until the holes for the mounting screw are aligned.
3. Install the expansion board mounting screw **C**.
4. Install the expansion board's power connectors **D**.
5. Install all option adapters previously removed, including the receiver card. (2026)
6. Install the expansion unit's cover. (2016)



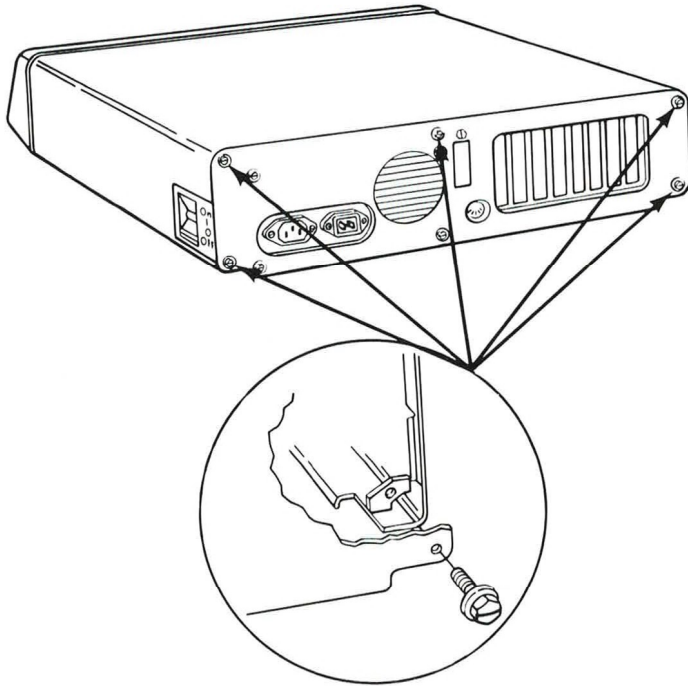
Expansion Unit Cover Removal 2015

1. Set the expansion unit's Power switch to Off, then unplug the power cord and disconnect all cables from the rear of the expansion unit.
2. Move all external options away from the work surface.
3. Remove the cover's mounting screws and slide the cover to the front until it clears the expansion unit.



Expansion Unit Cover Replacement 2016

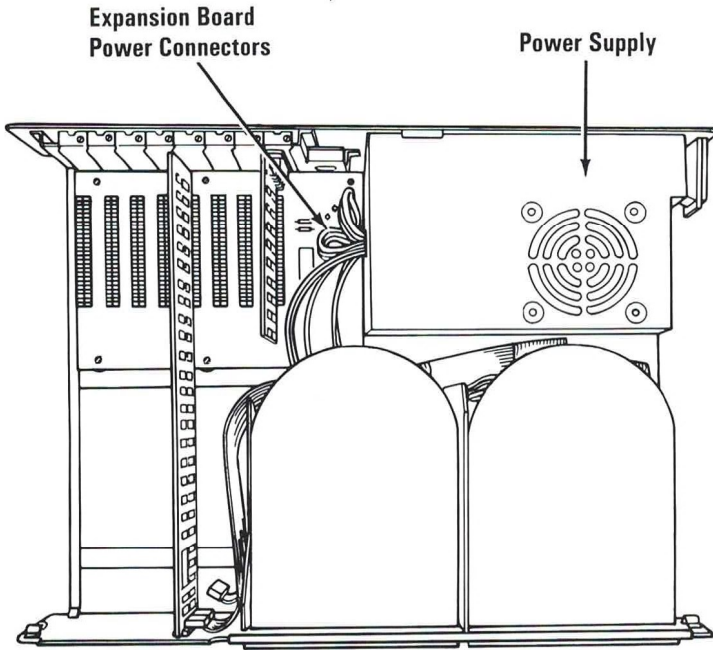
1. Slide the cover toward the rear of the unit.
2. Align the mounting screws with the threaded tabs and tighten.
3. Reconnect the cables to the expansion unit.



Expansion Unit Power Supply Removal 2020

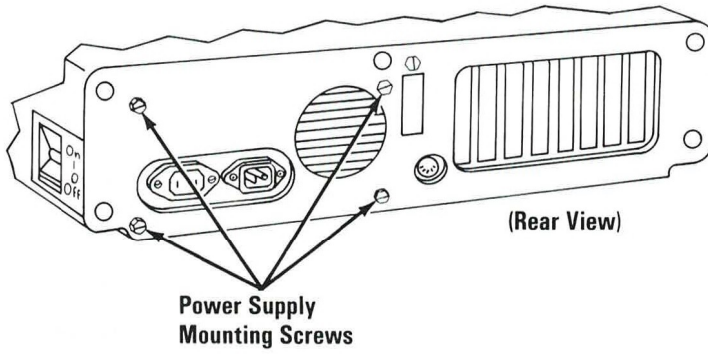
1. Remove the expansion unit's cover. (2015)
2. Disconnect the expansion board's power connectors by grasping the connector and pulling straight up.

Warning: Do not pull on the wires when disconnecting the connectors.

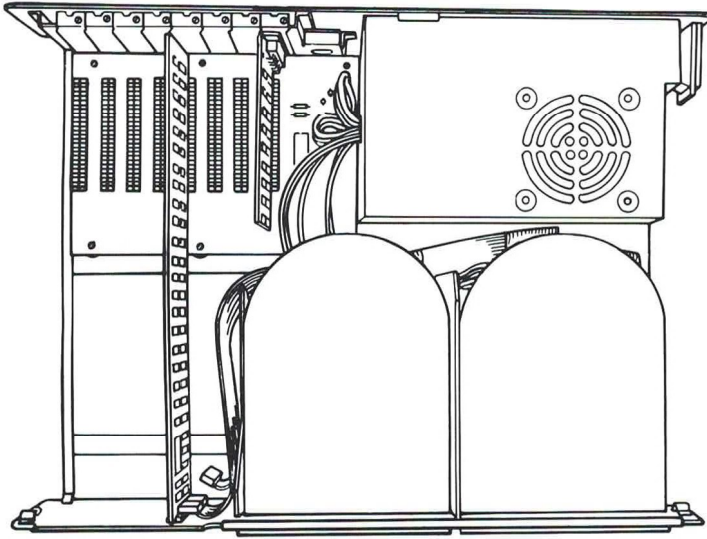


Note: The figure shows the top view of the expansion unit.

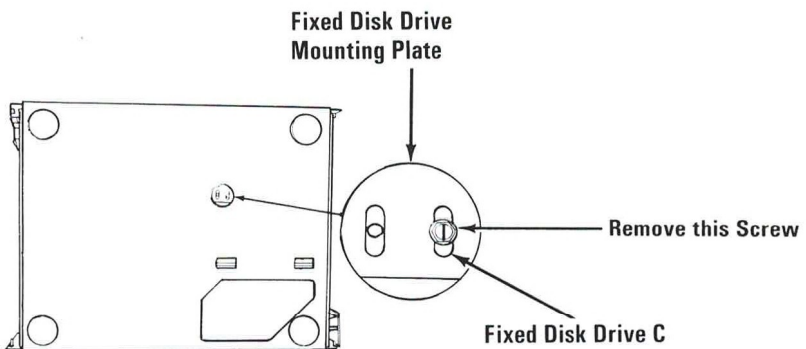
3. Disconnect the fixed-disk-drive and diskette-drive power connectors.
4. Remove the four power supply mounting screws.



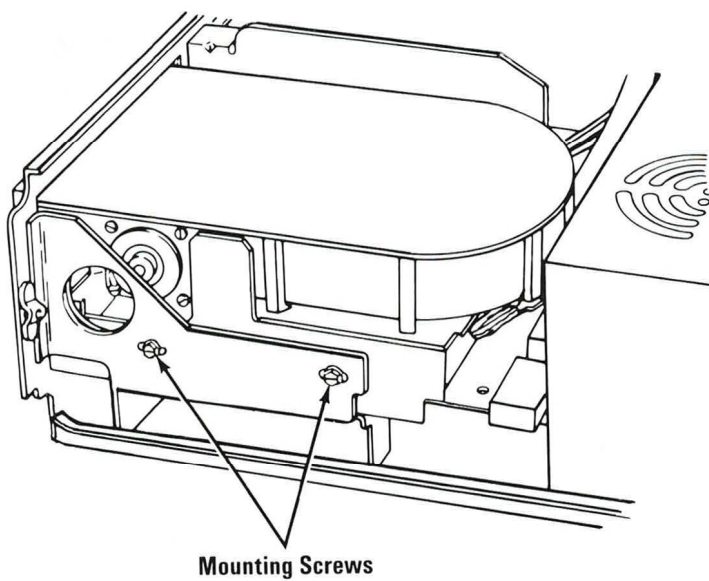
5. Hold the expansion unit by the front panel and tilt it up until it rests on the rear panel.



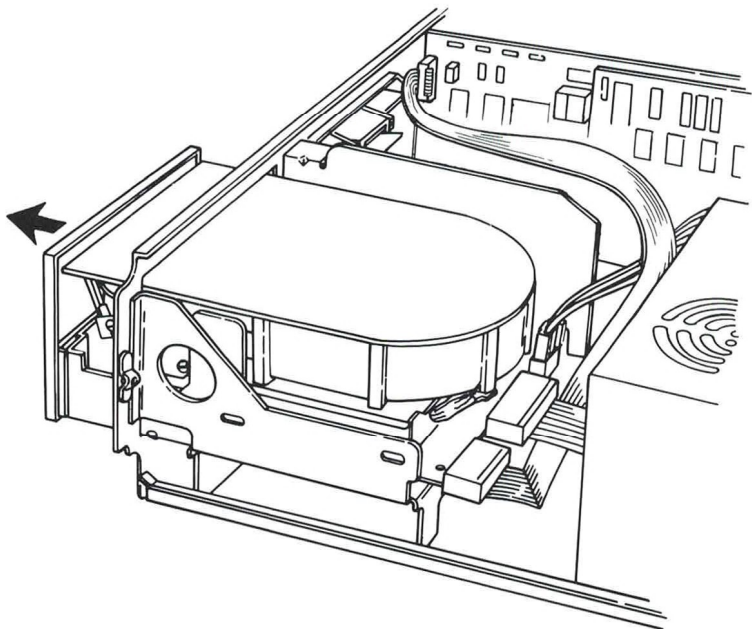
6. Remove the fixed disk drive's mounting screw (turn counterclockwise) with a flat-blade screwdriver or 3/16-inch nutdriver.



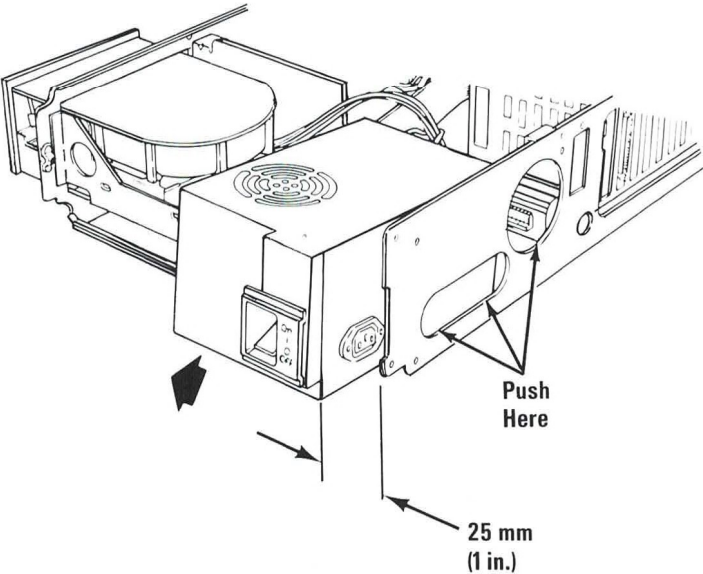
7. Remove the two fixed disk drive mounting screws.



8. Slide the fixed disk drive assembly toward the front of the machine approximately 25 mm (1 in.).

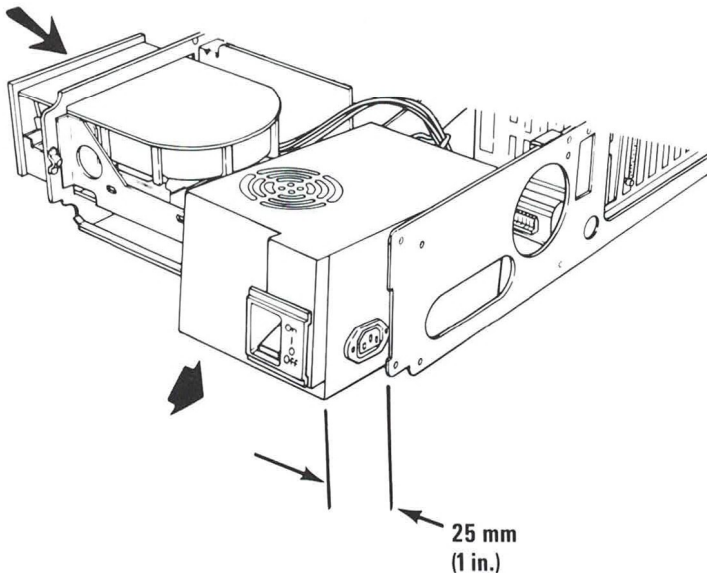


9. Push the power supply forward about 25 mm (1 in.), then lift up and remove.



Expansion Unit Power Supply Replacement 2021

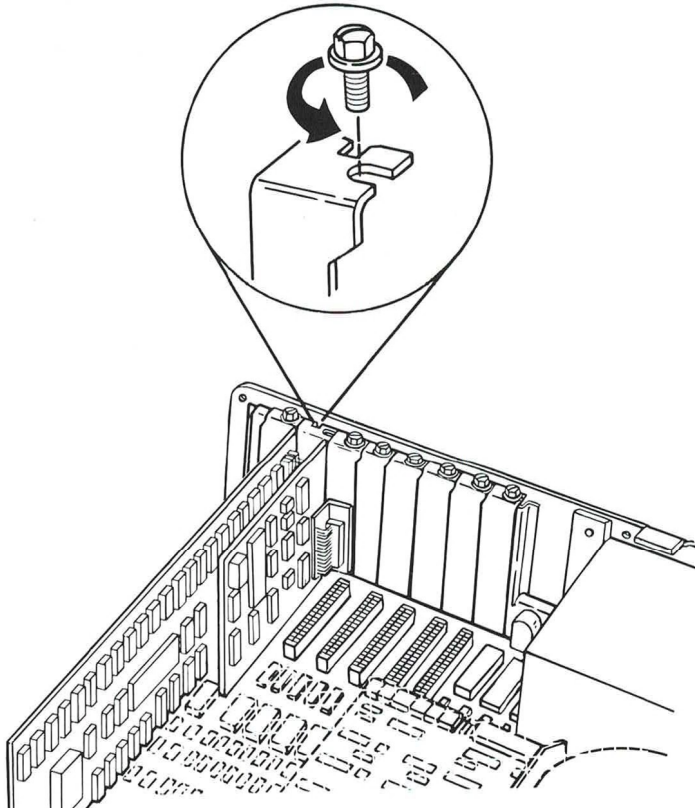
1. Place the power supply about 25 mm (1 in.) from the rear of the expansion unit's backplate and slide it into position.
2. Align the screw holes in the power supply with the rear frame.
3. Install and tighten the four power supply mounting screws.
4. Reconnect the fixed-disk-drive and diskette-drive power connectors.
5. Plug in the expansion board's power connectors.
6. Install the fixed disk drives. (2001) (2006)
7. Install the expansion unit's cover. (2016)
8. Reconnect the cables to the expansion unit.



Expansion Unit Option Adapters

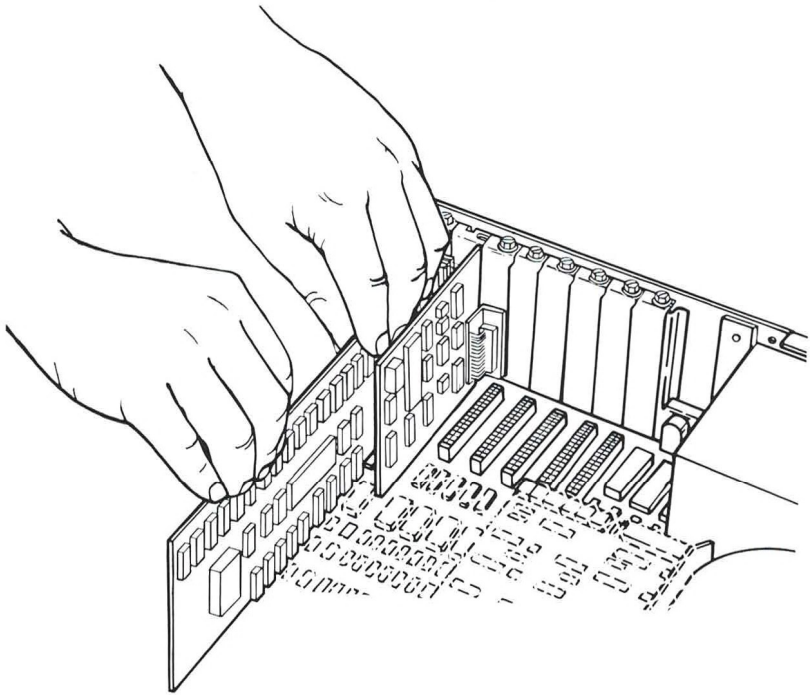
Option Adapter Removal 2025

1. Set the expansion unit's Power switch to Off.
2. Unplug the expansion unit's power cord from the wall outlet and disconnect all cables from the rear of the unit.
3. Remove the expansion unit's cover. (2015)
4. Remove the option adapter's mounting screw.
5. Make a note of the adapter slot in which the adapter is located.
6. Grasp the adapter by the top edge and lift straight up.



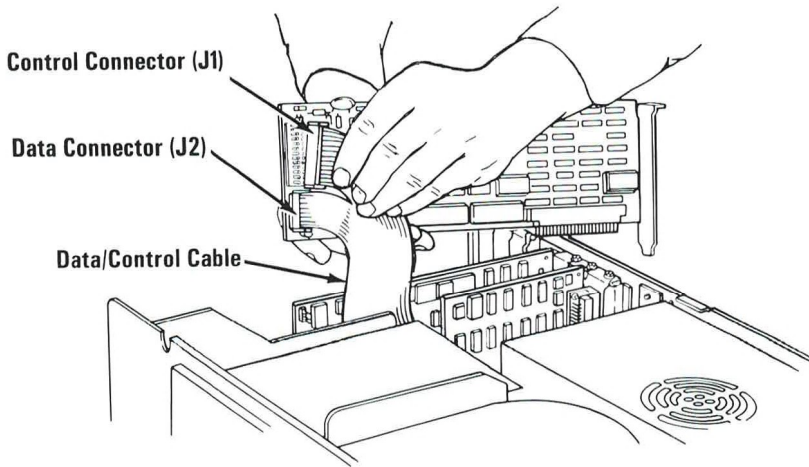
Option Adapter Replacement 2026

1. Insert the adapter into the same adapter slot from which it was removed.
2. Press down firmly on the adapter to ensure a good connection.
3. Install the adapter's mounting screw.
4. Install the expansion unit's cover. (2016)

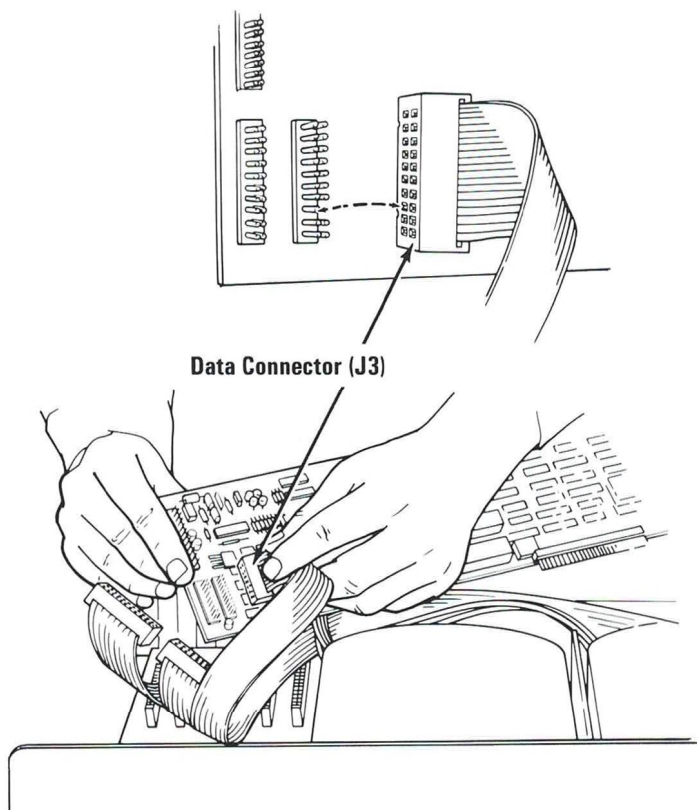


Fixed Disk Adapter Removal 2030

1. Set the Power switch on the system unit and expansion unit to Off.
2. Remove the expansion unit's cover. (2015)
3. Remove the Fixed Disk Adapter's mounting screw.
4. Make a note of the adapter slot the Fixed Disk Adapter is in.
5. Grasp the Fixed Disk Adapter by the top edge and lift straight up.
6. Remove data connector (J2) and control connector (J1).

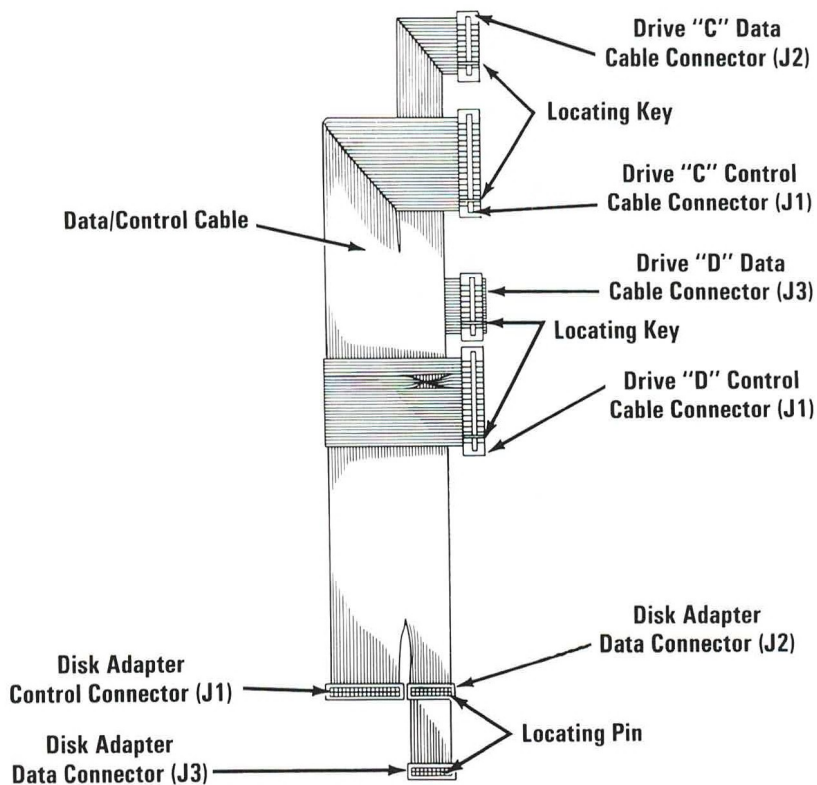


7. If two fixed disk drives are installed, remove data connector (J3).

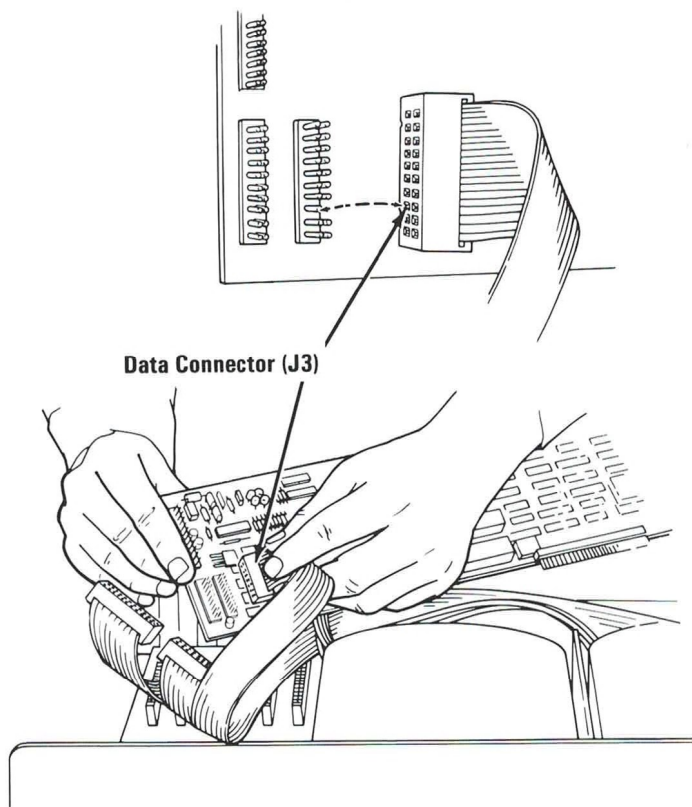


Fixed Disk Drive Adapter Replacement 2031

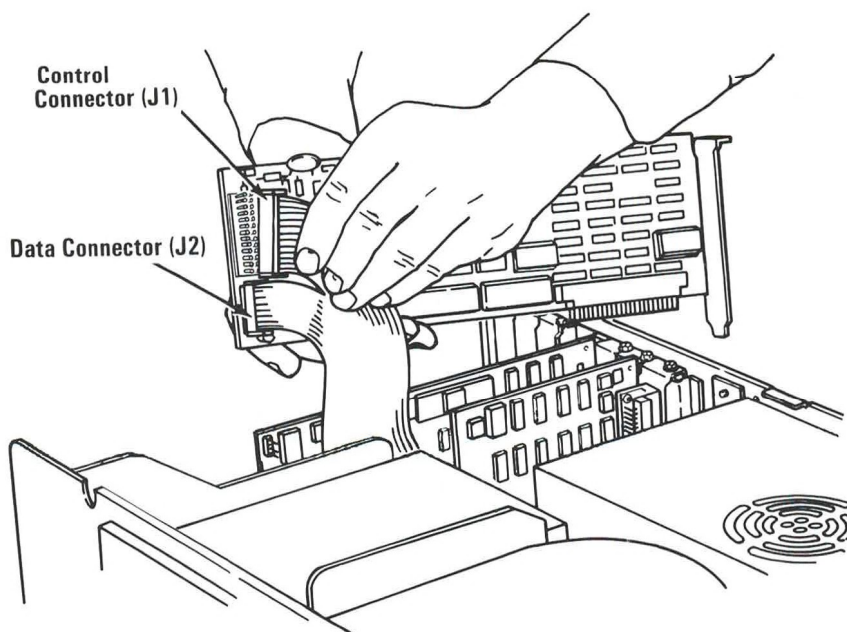
1. Look at the figure below and become familiar with the data/control cable before starting the installation.



2. If two fixed disk drives are installed, connect data connector (J3).



3. Connect the control connector (J1) and the data connector (J2).
4. Insert the Fixed Disk Adapter in the option expansion slot it was removed from.
5. Press down firmly on the adapter to seat the connector.
6. Install the Fixed Disk Adapter mounting screw.
7. Replace the expansion unit's cover. (2016)

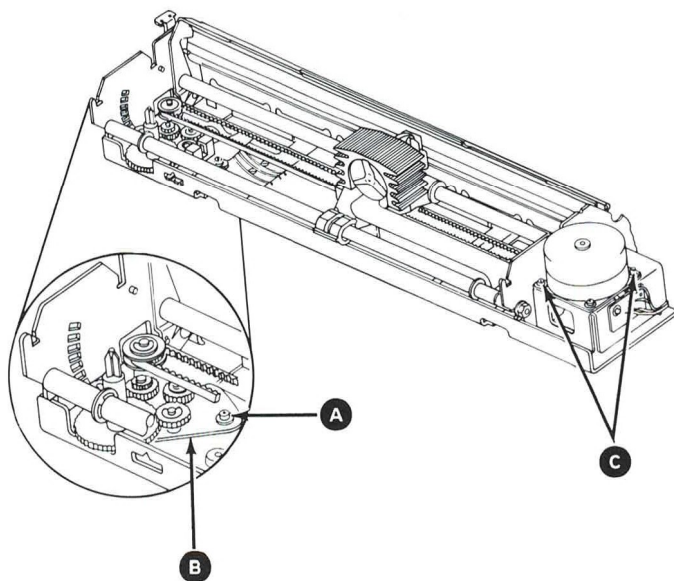


IBM Graphics Printer

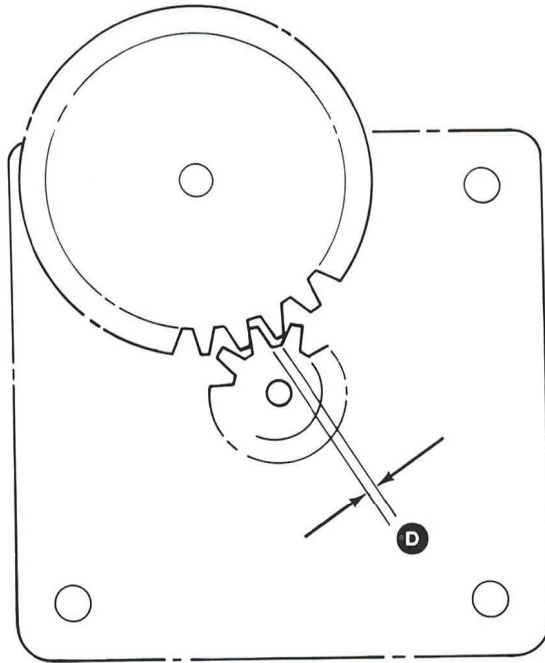
Carriage Belt Adjustment

1. Set the printer's Power switch to Off; unplug the printer's power cord from the wall outlet and disconnect the printer cable.
2. Remove all forms.
3. Remove the forms rack. (2180)
4. Remove the access cover. (2150)
5. Remove the ribbon cartridge.
6. Remove the top cover. (2155)

7. Loosen the hold-down screw **A** in the carriage drive assembly.
8. Pivot the carriage drive assembly **B** to the left to tighten the belt.
9. Tighten the hold-down screw.
10. Loosen the screws **C** in the carriage motor mounts.

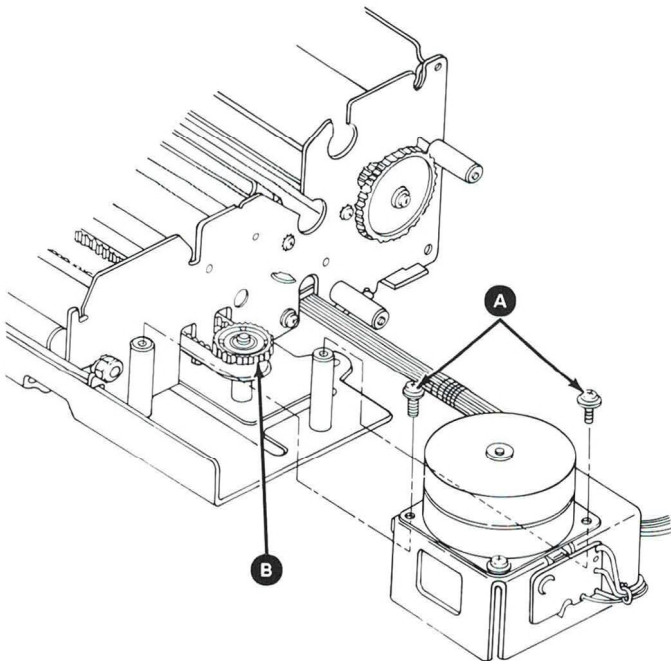


11. Place the carriage motor in position so the motor and drive gears mesh.
12. Adjust the gear **D** for minimum backlash.
13. Tighten the motor mount's screws.
14. Move the print head back and forth to check for smooth gear operation with no binding.

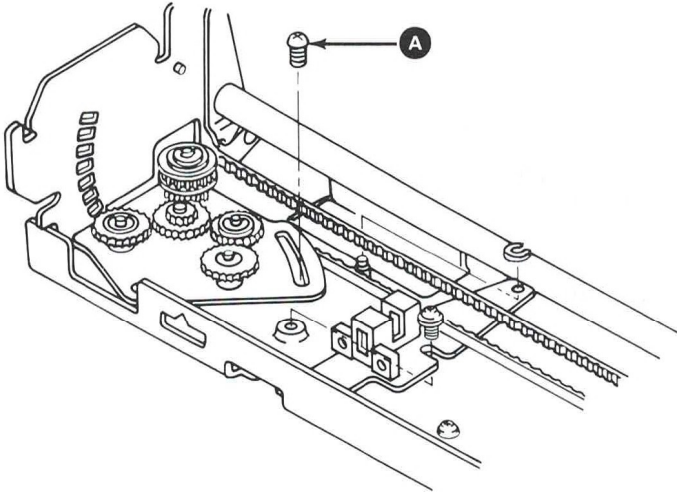


Carriage Belt Removal 2100

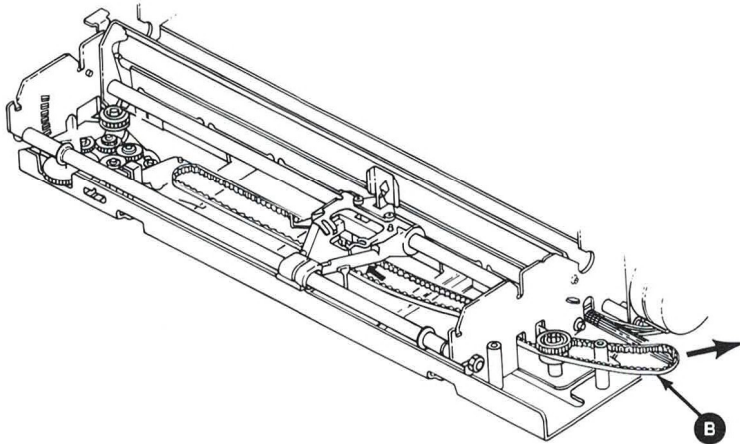
1. Set the printer's Power switch to Off; unplug the printer's power cord from the wall outlet and disconnect the printer cable.
2. Remove all forms.
3. Remove the forms rack. (2180)
4. Remove the access cover. (2150)
5. Remove the ribbon cartridge.
6. Remove the top cover. (2155)
7. Remove the left-front and right-rear screws **A** from the carriage motor mounts.
8. Lift the motor away from the mounts to expose the belt pulley **B**.



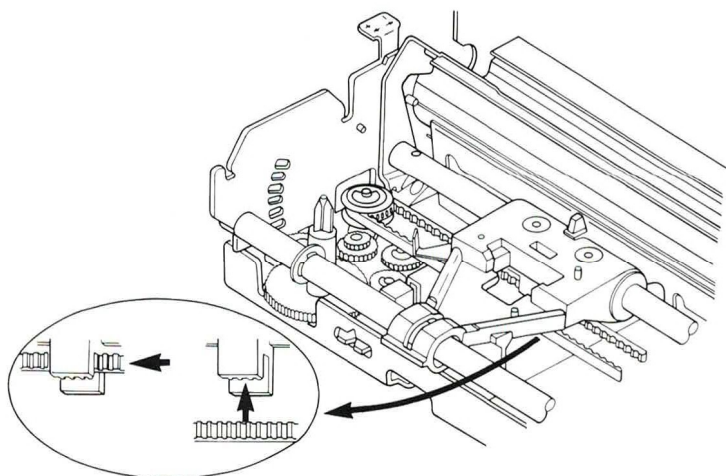
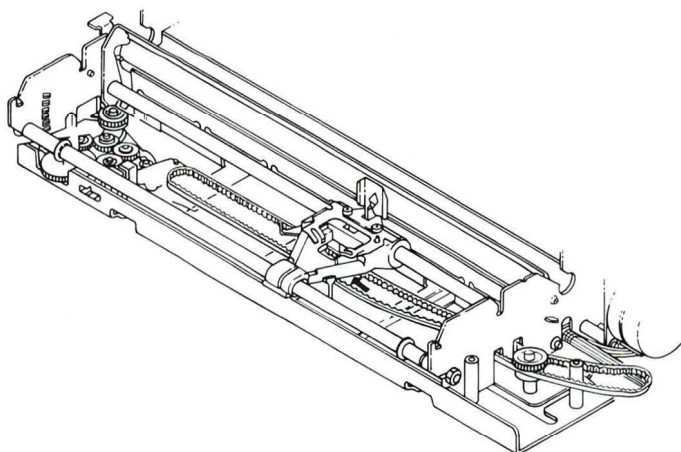
9. Pull the belt from the clip underneath the print head carriage by pulling down on the belt.
10. Loosen the screw **A** in the slot in the carriage drive assembly.
11. Pivot the carriage drive assembly to the right.



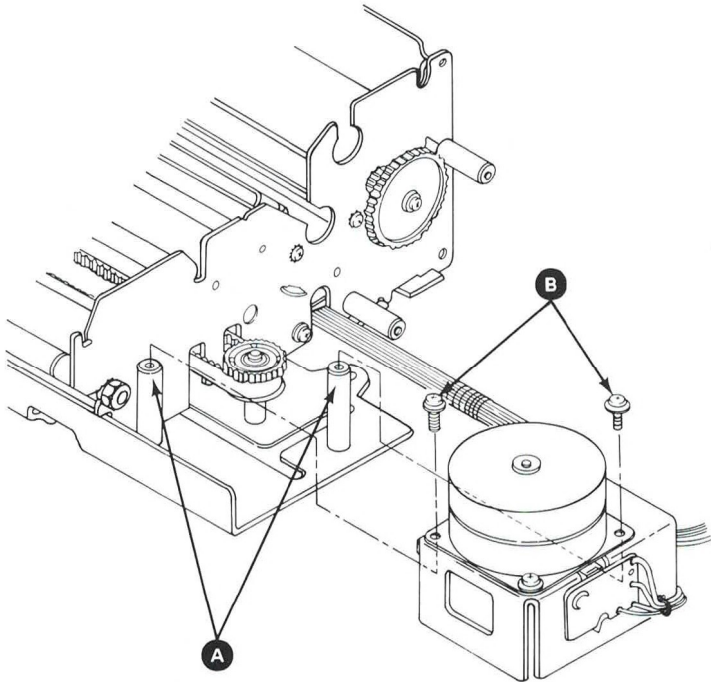
12. Lift the belt off the pulley at each end.
13. Guide the belt **B** through the opening in the right side of the print mechanism assembly frame.



1. Insert the belt through the opening in the right side of the frame of the print mechanism assembly.
2. Guide the belt along the base toward the carriage drive assembly.
3. Place the belt onto the pulleys at both ends.
4. Insert the belt into the retaining clip under the print head carriage.



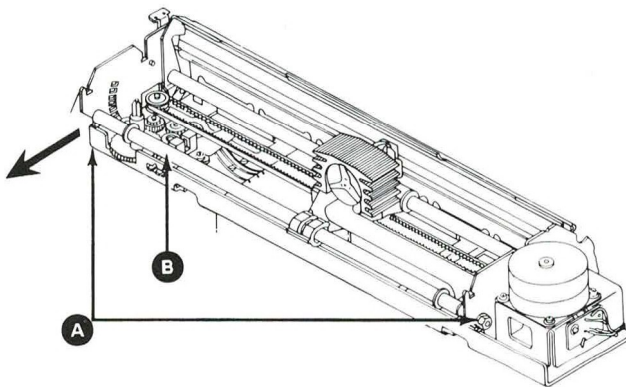
5. Place the carriage motor onto the motor mounts **A**.
6. Install the screws **B** into the motor base (do not tighten).
7. Adjust the carriage belt.
8. Install the top cover. (2160)
9. Install the ribbon cartridge.
10. Install the access cover. (2150)
11. Install the forms rack. (2180)



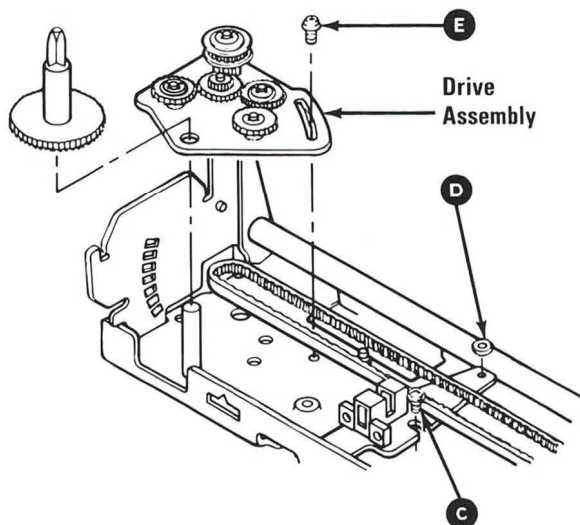
Carriage Drive Assembly Removal

2110

1. Set the printer's Power switch to Off; unplug the printer's power cord from the outlet and disconnect the printer cable.
2. Remove all forms.
3. Remove the forms rack. (2180)
4. Remove the access cover. (2150)
5. Remove the ribbon cartridge.
6. Remove the top cover. (2155)
7. Move the carriage to the right side of the frame.
8. Loosen the nuts **A** on the carriage shaft **B** and pivot the left end of the shaft to the front.



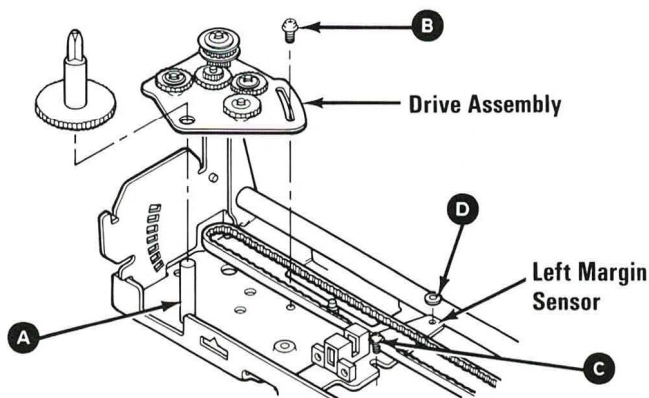
9. Remove the screw **C** and clamp **D** from the left margin sensor.
10. Remove the carriage drive assembly retaining screw **E**.
11. Pivot the carriage drive assembly clockwise, lift the belt off the drive pulley, lift the left margin sensor from the post, and lift the carriage drive assembly from the printer.



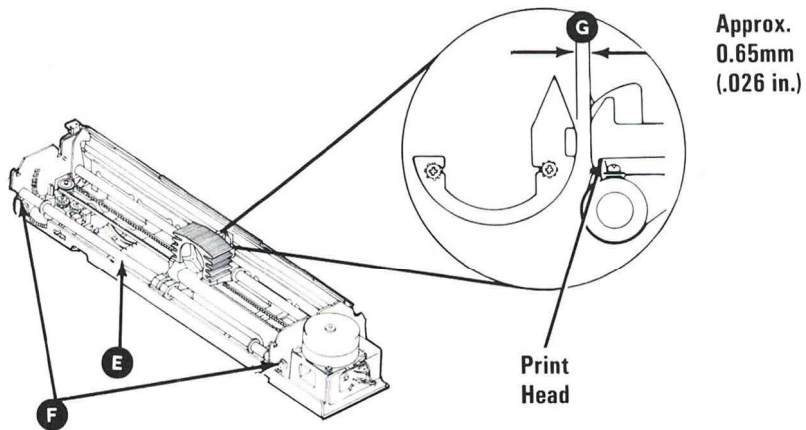
Carriage Drive Assembly Replacement

2115

1. Install the carriage drive assembly by inserting post **A** through the pivot hole.
2. Install the carriage drive assembly retaining screw **B**.
3. Install the left margin sensor, screw **C** , and clip **D**.
4. Place the belt over the drive pulley and perform the carriage belt adjustment.



5. Pivot the carrier shaft **E** into the slots on the frame. Tighten the nuts **F**.
6. Check the print head gap **G** and adjust if necessary. (2280)

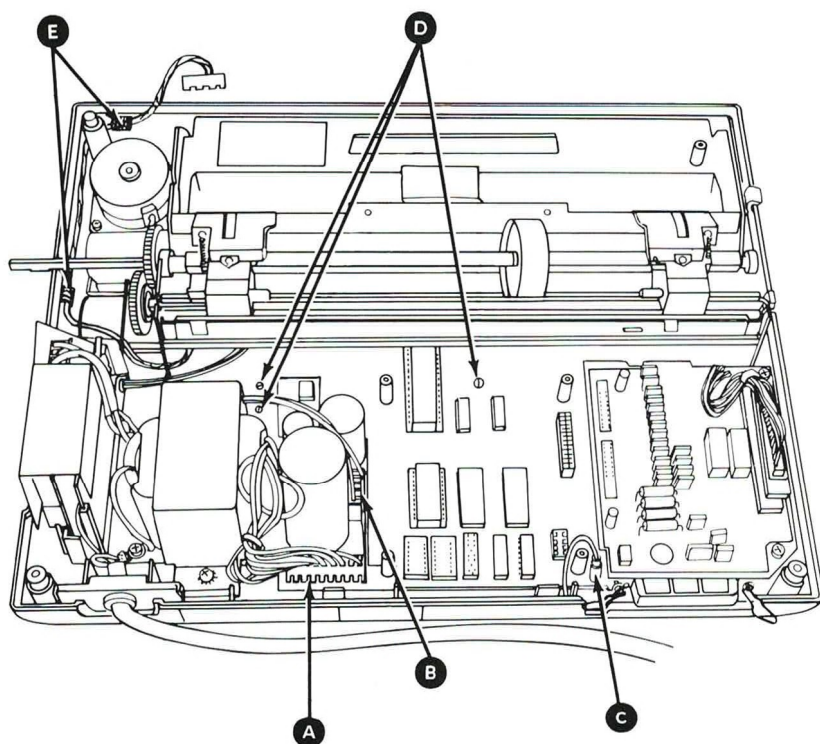


7. Adjust the left-margin sensor.
8. Install the top cover. (2160)
9. Install the ribbon cartridge.
10. Install the access cover. (2150)
11. Install the forms rack. (2180)

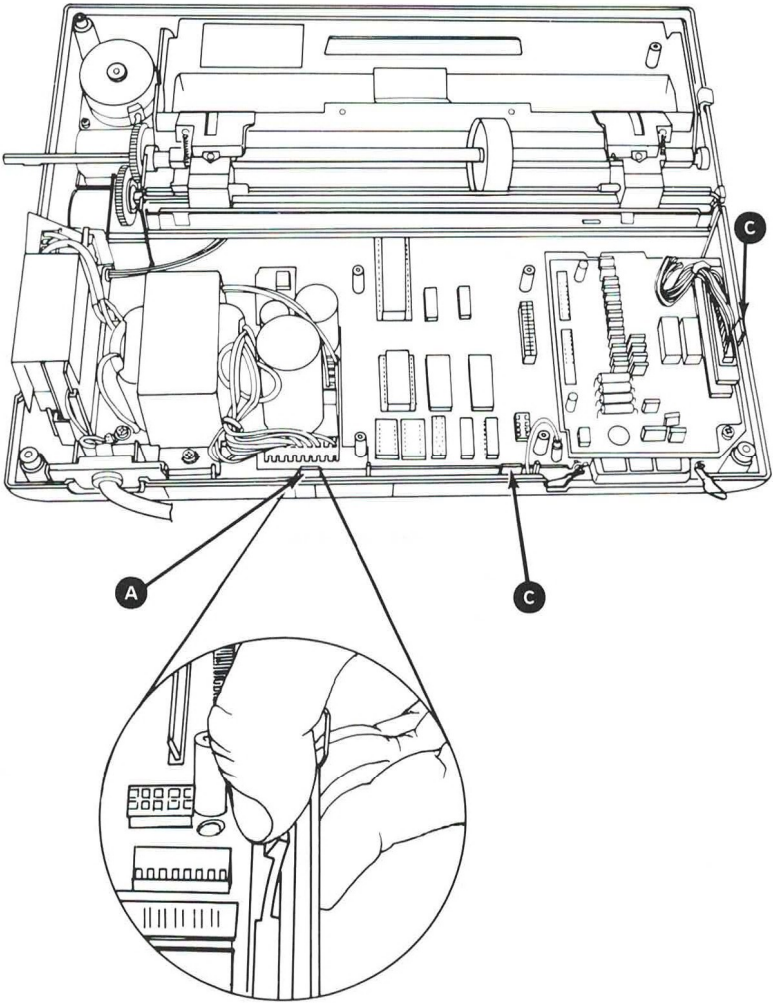
Control Circuit Card Removal 2120

1. Set the printer's Power to Off; unplug the printer's power cord from the wall outlet and disconnect the printer cable.
2. Remove the forms.
3. Remove the forms rack. (2180)
4. Remove the access cover. (2150)
5. Remove the top cover. (2155)
6. Remove the driver circuit card. (2130)

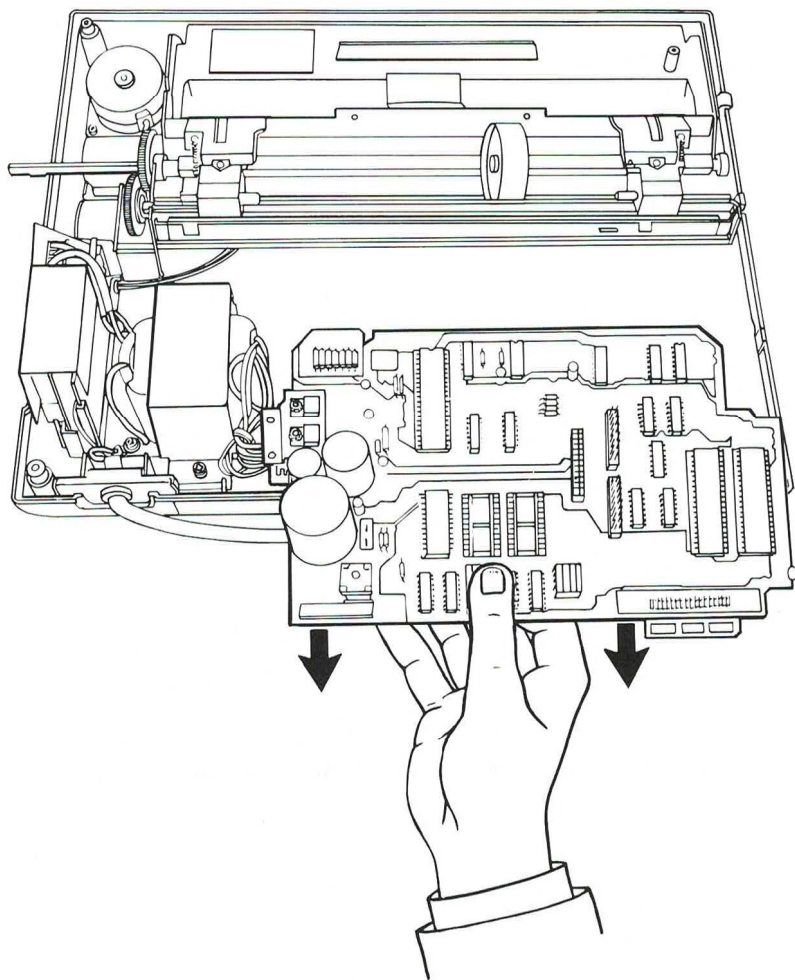
7. Unplug connector CN2 **A**.
8. Unplug connector CN6 **B**.
9. Unplug the ground wire **C**.
10. Remove the three screws **D**.
11. Pull the control panel cable from under the retaining clips **E**.



12. Press the three tabs **A**, **B**, and **C** and lift the card clear of the tabs.



13. Lift the control circuit card to clear the six posts. Carefully pull the control circuit card away from the print mechanism assembly.



Printer Dip Switch Chart

Before replacing the control circuit card, verify that the DIP Switches on the card match the charts below. For locations of switches, see Section 5.

IBM Graphics Printer

Function and Condition of DIP Switch 1

Switch Number	Function	On	Off	Factory-Set Condition
1-1	Not applicable	—	—	On
1-2	CR	Print only	Print and line feed	On
1-3	Buffer full	Print only	Print and line feed	Off
1-4	Cancel code	Not valid	Valid	Off
1-5	Not applicable	—	—	Off
1-6	Error buzzer	Sound	Does not sound	On
1-7	Character generator	Set 2	Set 1	On*
1-8	Select in signal	Fixed internally	Not fixed internally	On

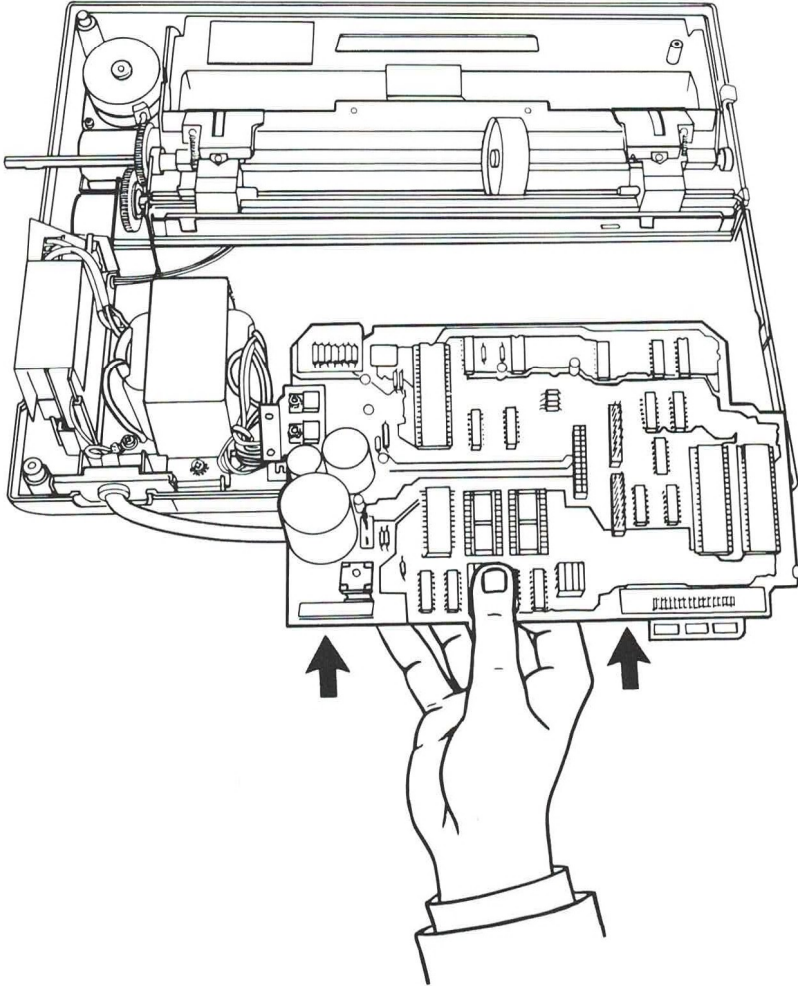
*Normal setting for countries other than U.S. English speaking. Character set 2 allows all international characters to be printed. Set as required for individual applications.

IBM Graphics Printer

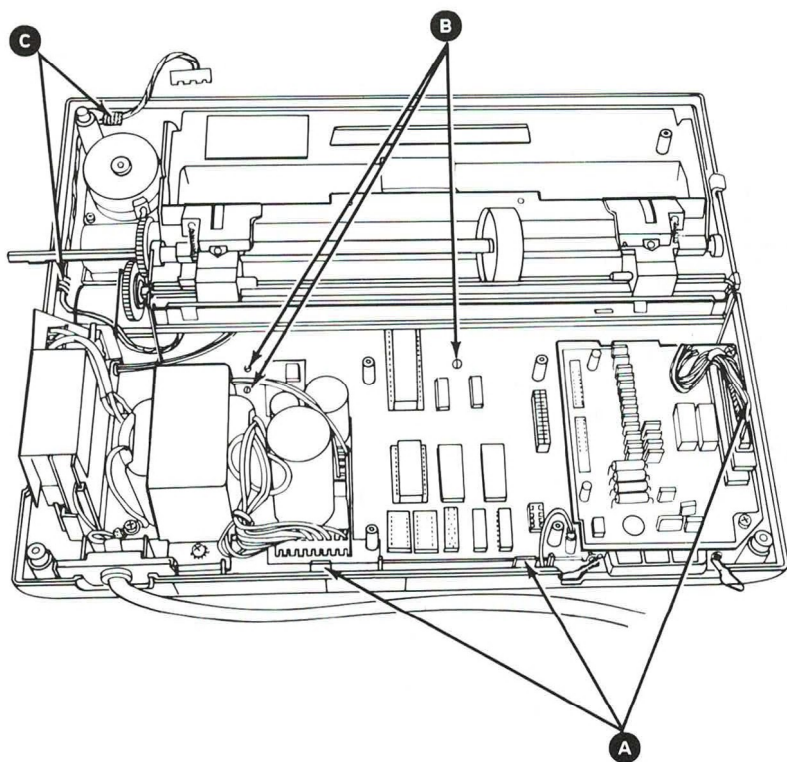
Function and Condition of DIP Switch 2

Switch No.	Function	On	Off	Factory-Set Condition
2-1	Form length	304.8 mm (12 in.)	279.4 mm (11 in.)	Off
2-2	Line spacing	3.175 mm (1/8 in.)	4.23 mm (1/6 in.)	Off
2-3	Auto feed XT signal	Fixed internally	Not fixed internally	Off
2-4	1" skip over perforation	Valid	Not valid	Off

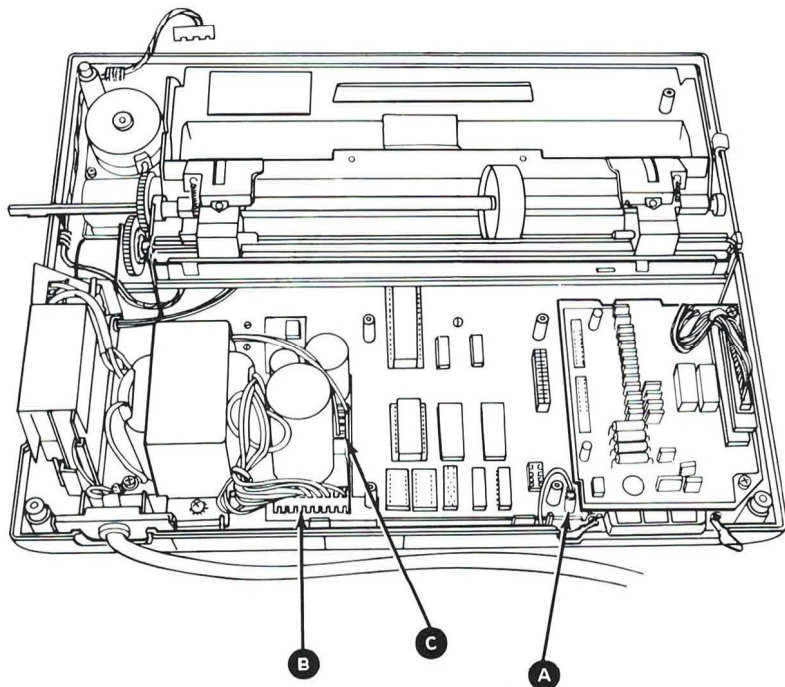
1. Guide the control circuit card into the open area behind the print mechanism assembly.



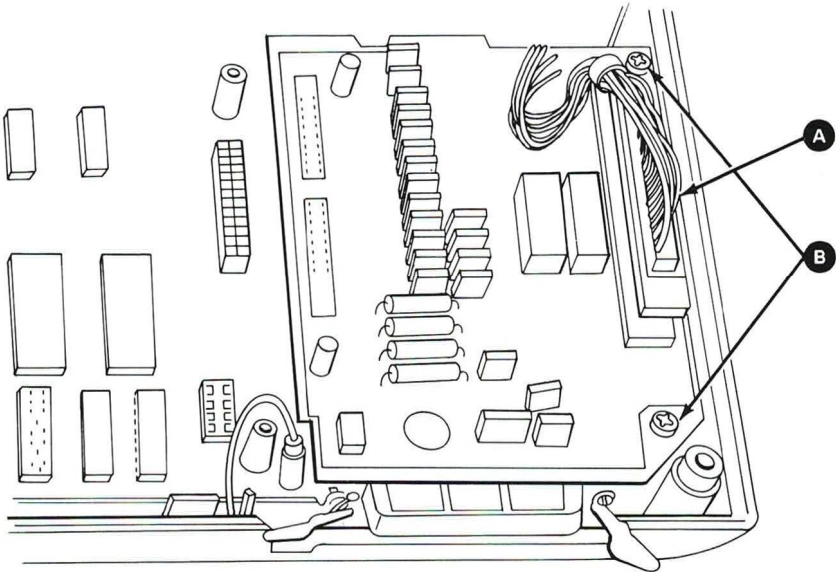
2. Align the six holes in the control circuit card with the six posts in the base cover.
3. Lower the control circuit card onto the base cover and snap the three retaining tabs **A** into place.
4. Install the three hold-down screws **B**.
5. Guide the control panel cable along the right side of the base cover and around to the front.
6. Place the control panel cable under the two retaining clips **C**.



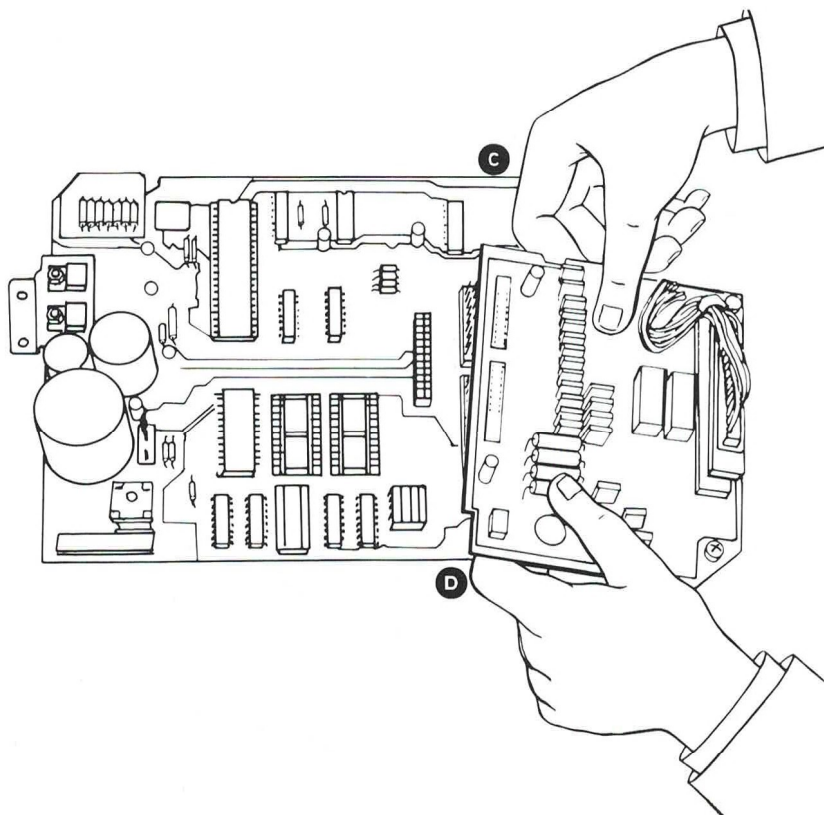
7. Connect the ground wire **A**.
8. Install connector CN2 **B**.
9. Install connector CN6 **C**.
10. Install the driver circuit card. (2135)
11. Check the DIP switch settings for your machine.
12. Install the top cover. (2160)
13. Install the access cover. (2150)
14. Install the forms rack. (2180)



1. Set the printer's Power switch to Off; unplug the printer's power cord from the wall outlet and disconnect the printer cable.
2. Remove all forms.
3. Remove the forms rack. (2180)
4. Remove the access cover. (2150)
5. Remove the top cover. (2155)
6. Unplug connector CN6 **A**.
7. Remove the two screws **B**.



8. Disconnect the driver circuit card from the control card at CN4 and CN5. Lift at **C**, then at **D**.

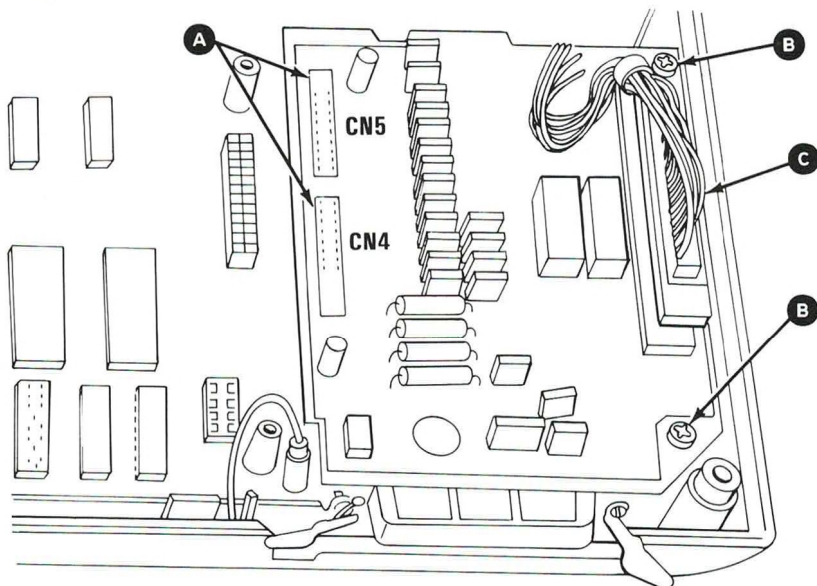


1. Align the two connectors CN4 and CN5 **A** on bottom of the driver circuit card with connectors CN4 and CN5 on the control circuit card.

CAUTION

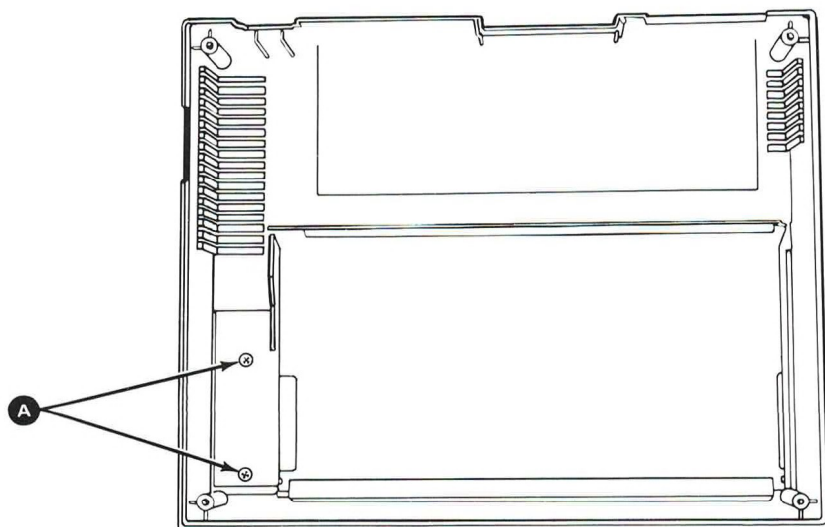
CN4 and CN5 are not keyed. Verify proper alignment before setting the Power switch to On, to prevent circuit card damage.

2. Connect the driver circuit card to the control circuit card by pressing down firmly on the connectors. Be sure to guide the cable for connector CN6 into the slot on the left-front edge of the driver circuit.
3. Install the two screws **B**.
4. Install connector CN6 **C**.
5. Install the top cover. (2160)
6. Install the access cover. (2150)
7. Install the forms rack. (2180)



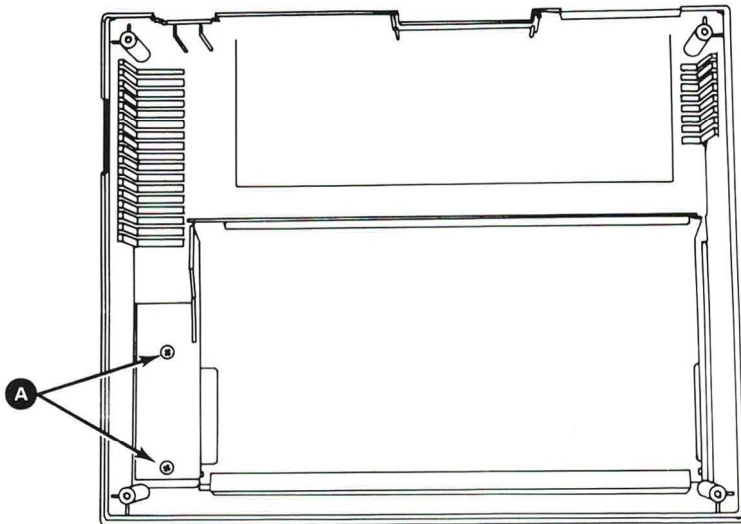
Control Panel Removal 2140

1. Set the printer's Power switch to Off; unplug the printer's power cord from the wall outlet and disconnect the printer cable.
2. Remove the forms.
3. Remove the forms rack. (2180)
4. Remove the access cover. (2150)
5. Remove the top cover. (2155)
6. Invert the top cover.
7. Remove the two screws **A** from the bottom of the top cover.
8. Lift the control panel from the top cover.



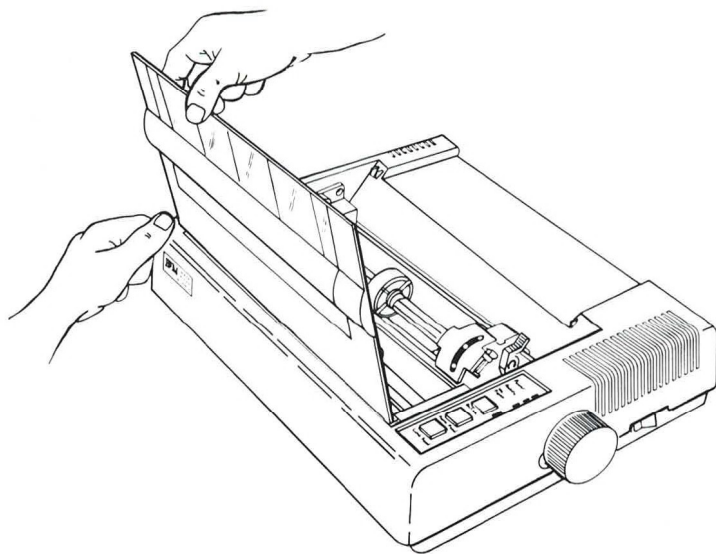
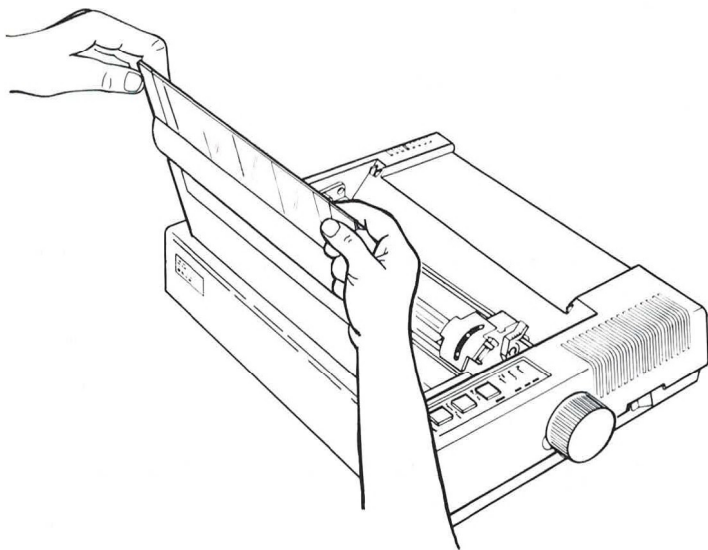
Control Panel Replacement 2145

1. Insert the control panel into the top cover.
2. Install the two screws **A**.
3. Install the top cover. (2160)
4. Install the access cover. (2150)
5. Install the forms rack. (2180)



Access Cover Removal 2150

1. Raise the access cover.
2. Lift the cover from the base as shown.

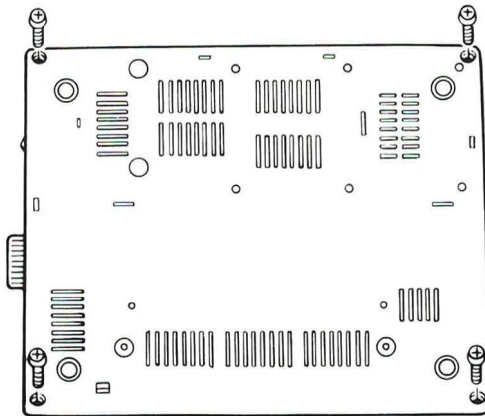


Top Cover Removal 2155

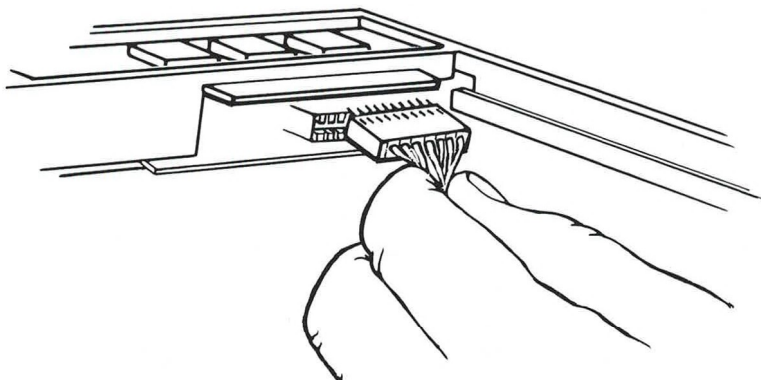
1. Set the printer Power switch to Off; unplug the power cord from the wall outlet.
2. Remove the forms.
3. Remove the forms rack. (2180)
4. Remove the access cover. (2150)
5. Pull the Forms Feed knob from its shaft using a steady firm pull.
6. Turn the printer upside down and place it on a smooth surface.
7. Using a Phillips screwdriver, remove the four corner screws in the base.

Warning: Be sure to grasp both the printer and the base cover.

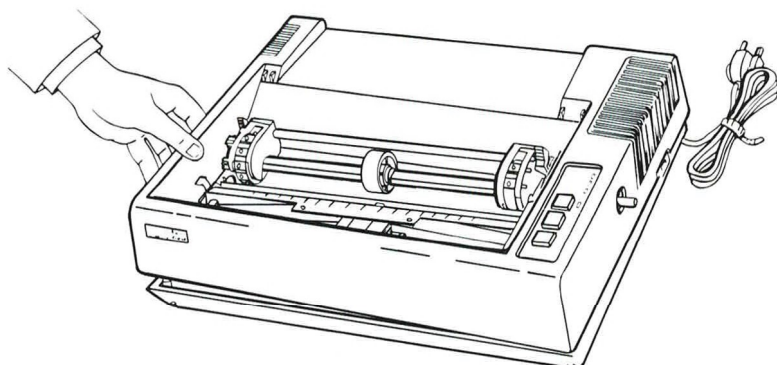
8. Turn the printer over.



9. Pull the control-panel cable connector from the control panel in the top cover.

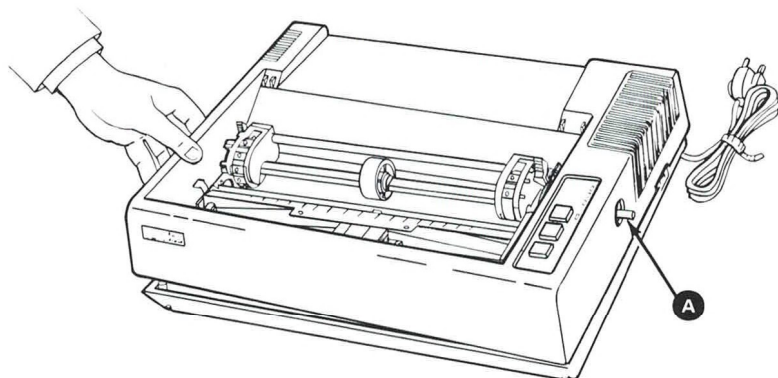


10. Lift the top cover away from the base cover. Lift the left side first, then slide the top cover to the right to clear the forms feed shaft.

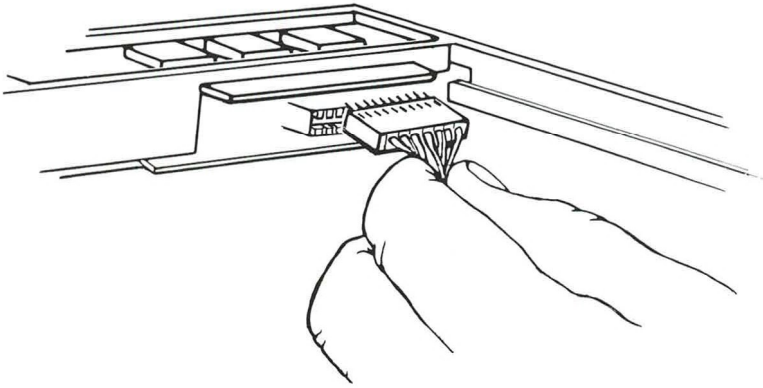


Top Cover Replacement 2160

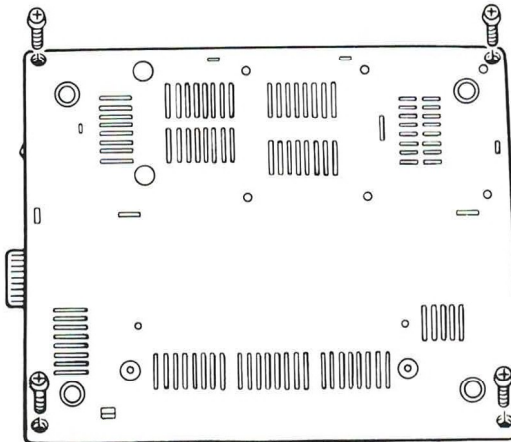
1. Insert the forms feed shaft through the opening **A** in the top cover and lower the top cover onto the base cover.



2. Connect the control-panel cable to the control panel.



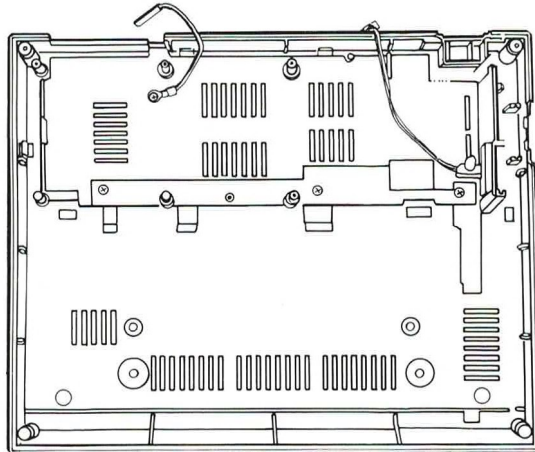
3. Turn the printer upside down.
4. Install the four screws.
5. Turn the printer over.
6. Install the Forms Feed knob. (2175)
7. Install the access cover. (2150)
8. Install the forms rack. (2180)



Base Cover Removal 2165

1. Set the printer's Power switch to Off; unplug the printer's power cord from the wall outlet and disconnect the printer cable.
2. Remove the forms.
3. Remove the forms rack. (2180)
4. Remove the access cover. (2150)
5. Remove the top cover. (2155)
6. Remove the power transformer. (2250) (2260)
7. Remove the fuse-filter card/power cord. (2200) (2210)
8. Remove the driver circuit card. (2130)
9. Remove the control circuit card. (2120)
10. Remove the print mechanism assembly. (2285)
11. Remove the heat sink/power transistor assembly. (2220)

The base cover is now completely detached from the other FRUs.

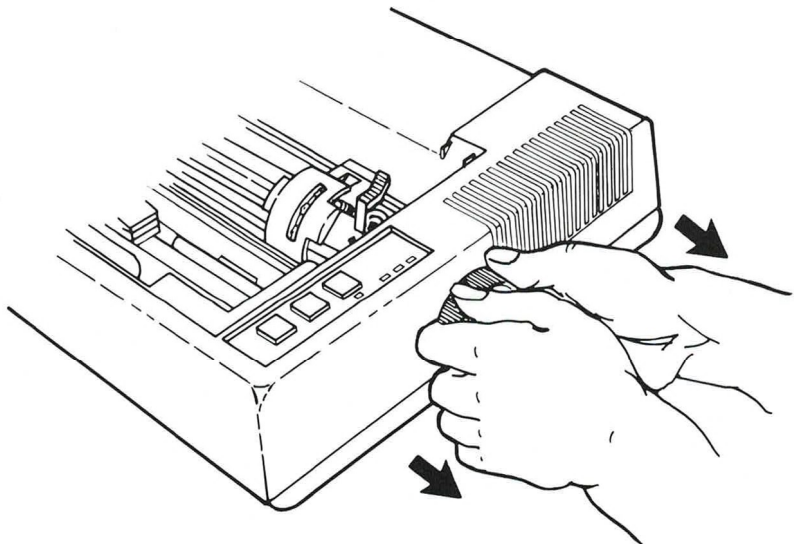


Base Cover Replacement 2170

1. Set the base cover on a work surface.
2. Install the heat sink/power transistor assembly. (2225)
3. Install the print mechanism assembly. (2290)
4. Install the control circuit card. (2125)
5. Install the driver circuit card. (2135)
6. Install the fuse-filter card/power cord. (2205) (2215)
7. Install the power transformer. (2255) (2265)
8. Install the top cover. (2160)
9. Install the access cover. (2150)
10. Install the forms rack. (2180)

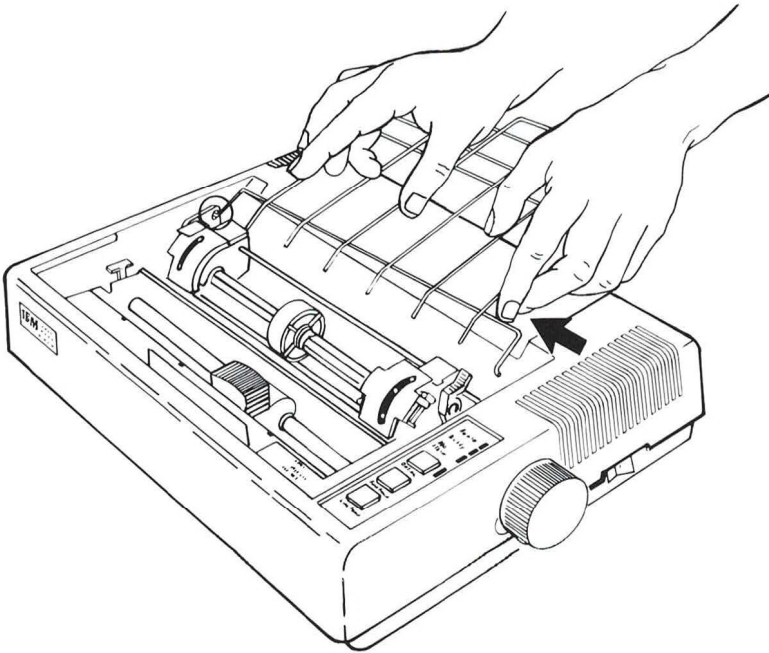
Forms Feed Knob Removal 2175

Pull the Forms Feed knob from the shaft, using a steady, firm pull.



Forms Rack Removal 2180

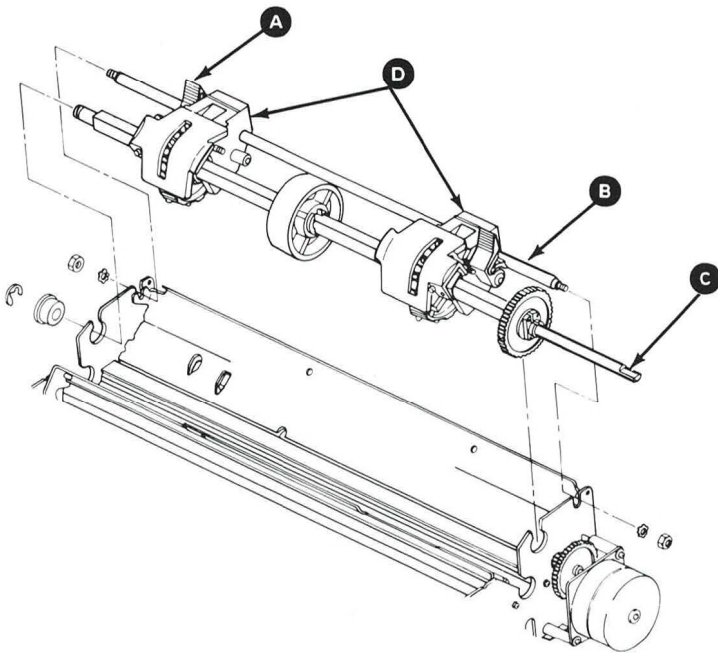
1. Remove all forms.
2. Compress the rack on one side to unhook it from the printer frame.
3. Lift the rack away from the frame.



Forms Tractor Removal 2185

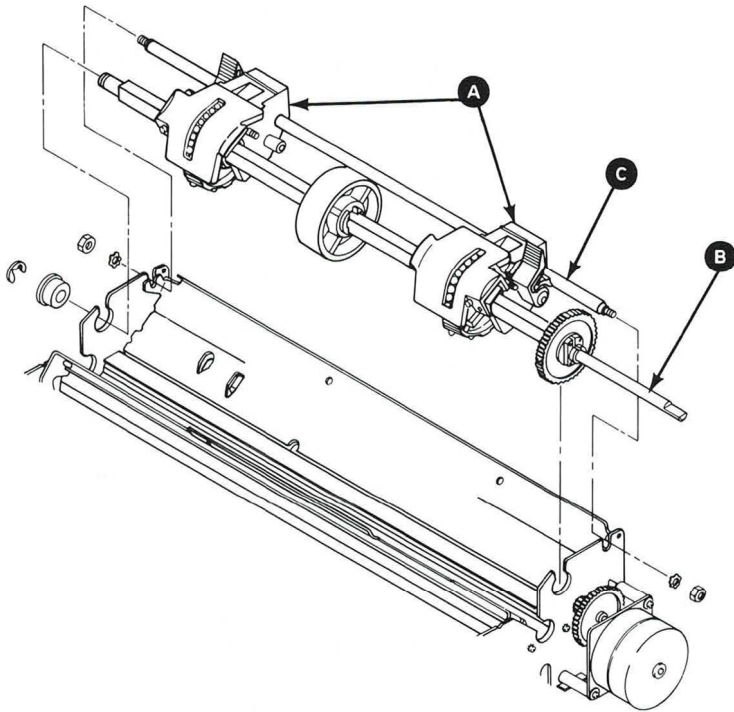
1. Set the printer Power switch to Off; unplug the power cord from the wall outlet and disconnect the printer cable.
2. Remove the forms.
3. Remove the forms rack. (2180)
4. Remove the access cover. (2150)
5. Remove the top cover. (2155)

6. Rotate the lock levers **A** to the forward (released) position.
7. Loosen the nuts **B** on the ends of the tractor support shaft.
8. Remove the retaining clip on the left end of the guide shaft **C** and slide the bushings to the outside of the frame.
9. Lift the guide shaft, the support shaft, and the forms tractors from the machine.
10. Slide the forms tractors **D** from the shafts.



Forms Tractor Replacement 2190

1. Slide the forms tractors **A** onto the guide shaft **B** and the support shaft **C**.
2. Place the guide shaft and the support shaft into the slots on the frame.
3. Slide the bushings on the guide shaft into the frame and place the retaining nuts on the ends of the support shaft.
4. Install the top cover. (2160)
5. Install the access cover. (2150)
6. Install the forms rack. (2180)

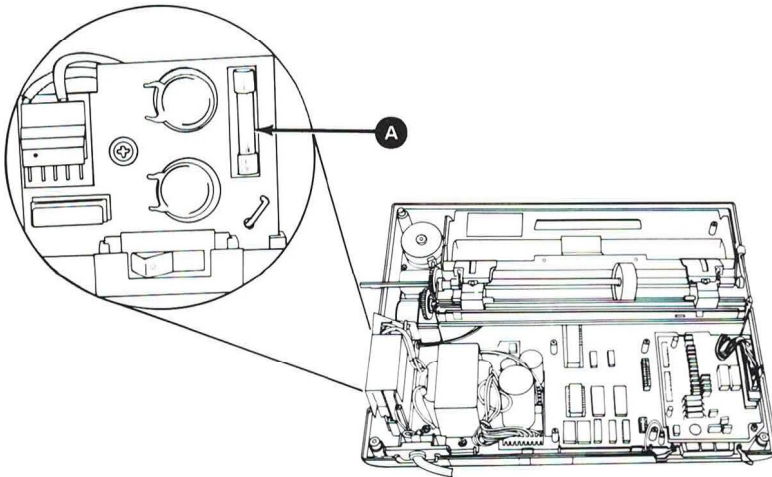


Fuse Removal 2195

1. Set the printer's Power switch to Off; unplug the printer's power cord from the wall outlet and disconnect the printer cable.
2. Remove the forms.
3. Remove the forms rack. (2180)
4. Remove the access cover. (2150)
5. Remove the top cover. (2155)

DANGER
STATIC VOLTAGE MAY BE PRESENT ON THE
FUSE-FILTER CARD. USE CAUTION IN THIS
AREA.

6. Remove the safety shield on the fuse-filter card. (2305)
7. Pull the fuse **A** from the holder.

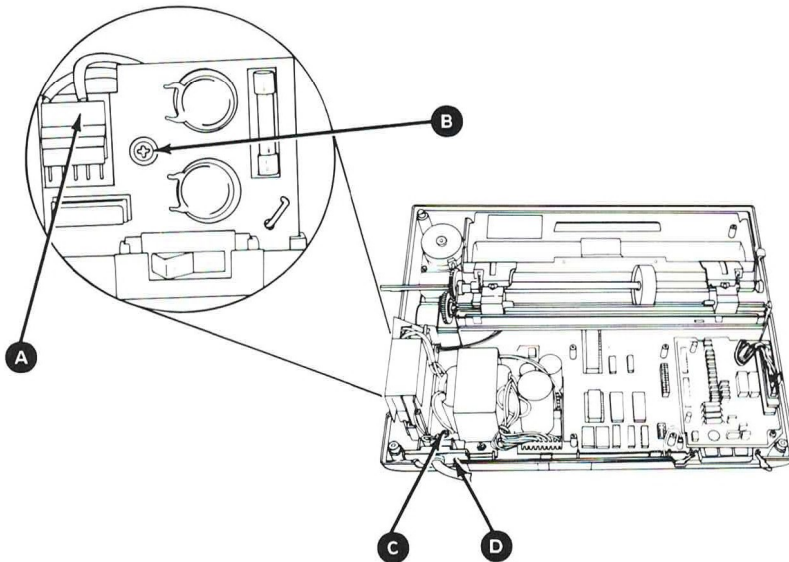


Fuse-Filter Card Removal-220/240 Volt 2200

1. Set the printer's Power switch to Off; unplug the printer's power cord from the wall outlet and disconnect the printer cable.
2. Remove the forms.
3. Remove the forms rack. (2180)
4. Remove the access cover. (2150)
5. Remove the top cover. (2155)

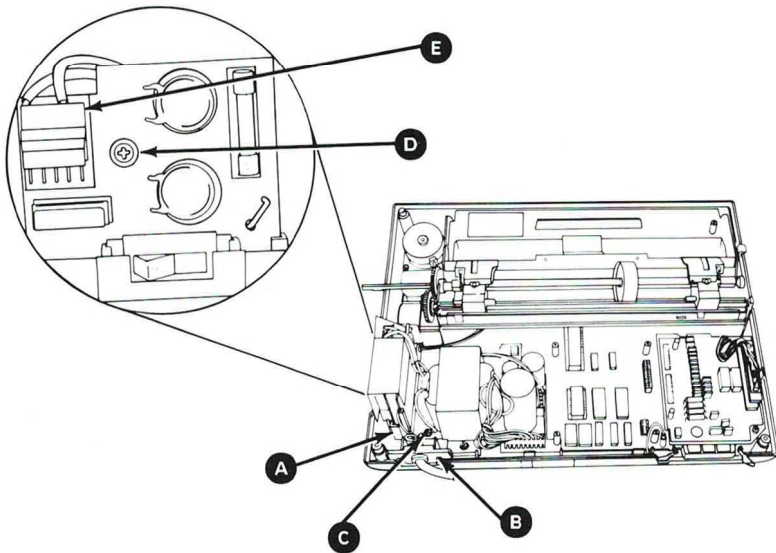
DANGER
STATIC VOLTAGE MAY BE PRESENT ON THE
FUSE-FILTER CARD. USE CAUTION IN THIS
AREA.

6. Remove the safety shield from the fuse-filter card assembly.
(2305)
7. Remove the transformer primary connector **A** from the fuse-filter card.
8. Remove the screw **B** from the center of the fuse-filter card.
9. Remove the screw **C** from the ground wire of the ac socket.
10. Lift the ac socket **D** from the slot in the base cover.
11. Lift the fuse-filter card from the slot in the base cover.



Fuse-Filter Card Replacement--220/240 Volt 2205

1. Insert the fuse-filter card into the slot **A** in the base cover.
2. Insert the ac socket into the slot **B** in the base cover.
3. Install the screw **C** into the ground wire of the ac socket.
4. Install the screw **D** into the center of the fuse-filter card.
5. Connect the transformer primary connector **E** to the fuse-filter card.



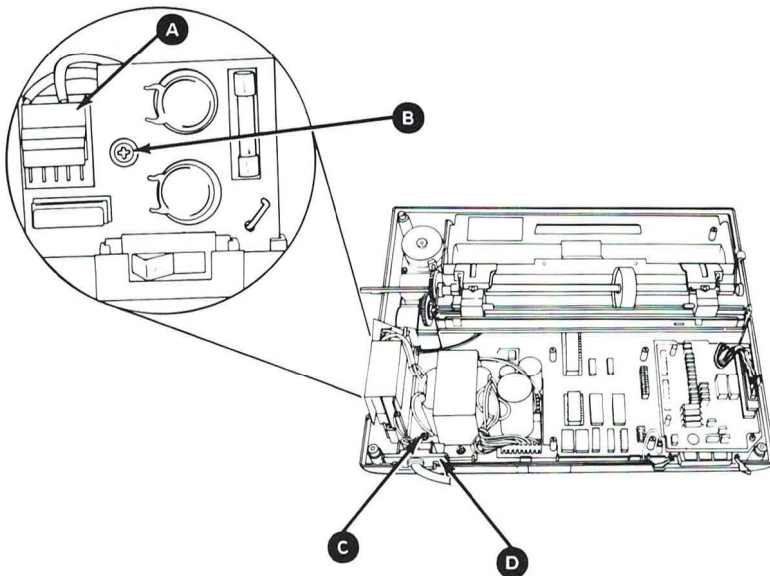
6. Install the safety shield onto the fuse-filter card. (2305)
7. Install the top cover. (2160)
8. Install the access cover. (2150)
9. Install the forms rack. (2180)

Fuse-Filter Card/Power Cord Removal--120 Volt 2210

1. Set the printer's Power switch to Off; unplug the printer's power cord from the wall outlet and disconnect the printer cable.
2. Remove the forms.
3. Remove the forms rack. (2180)
4. Remove the access cover. (2150)
5. Remove the top cover. (2155)

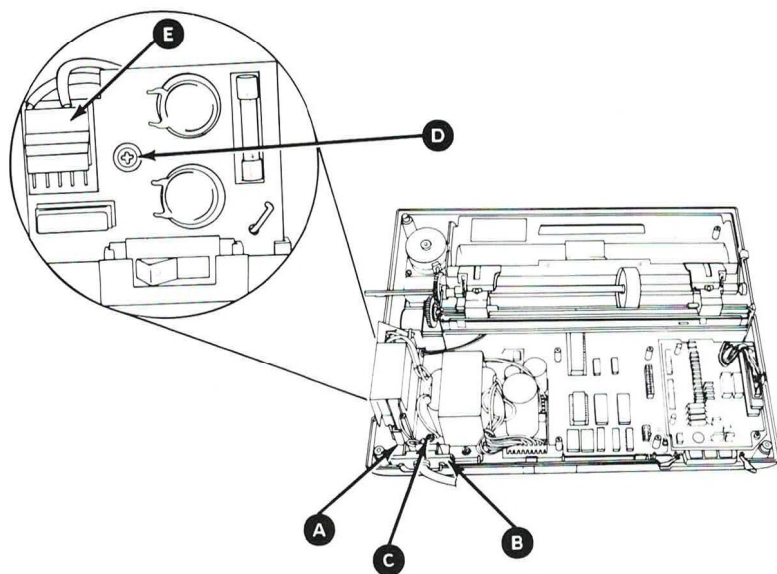
DANGER
STATIC VOLTAGE MAY BE PRESENT ON THE
FUSE-FILTER CARD. USE CAUTION IN THIS
AREA.

6. Remove the safety shield from the fuse-filter card assembly.
(2305)
7. Remove the transformer primary connector **A** from the fuse-filter card.
8. Remove the screw **B** from the center of the fuse-filter card.
9. Remove the screw **C** from the ground terminal of the printer power cord.
10. Lift the strain relief **D** from the slot in the base cover.
11. Lift the fuse-filter card from the slot in the base cover.



Fuse-Filter Card/Power Cord Replacement--120 Volt 2215

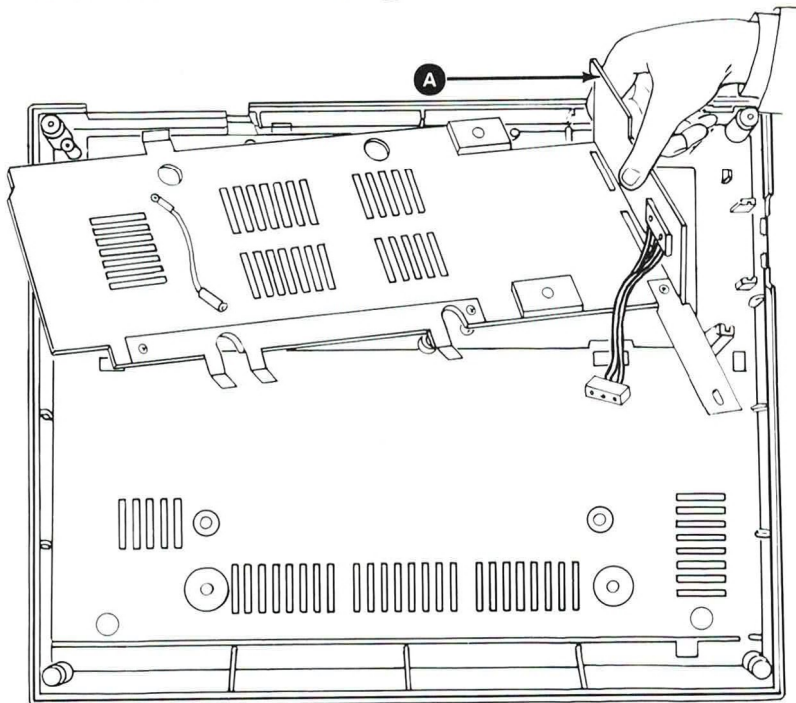
1. Insert the fuse-filter card into the slot **A** in the base cover.
2. Insert the strain relief into the slot **B** in the base cover.
3. Install the screw **C** into the ground terminal of the power cord.
4. Install the screw **D** in the center of the fuse-filter card.
5. Connect the transformer primary connector **E** to the fuse-filter card.



6. Install the safety shield onto the fuse-filter card. (2305)
7. Install the top cover. (2160)
8. Install the access cover. (2150)
9. Install the forms rack. (2180)

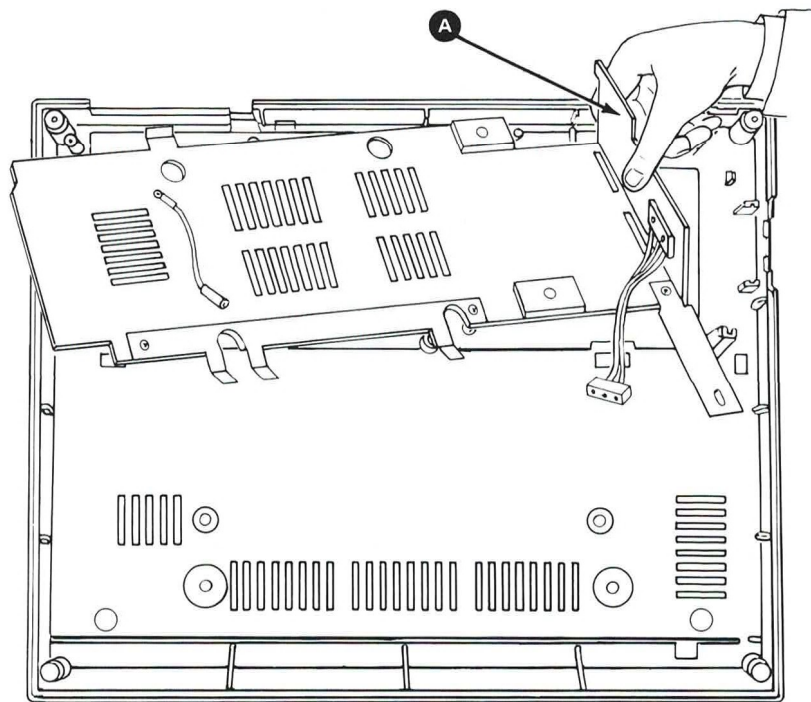
Heat Sink/Power Transistor Assembly Removal 2220

1. Set the printer's Power switch to Off; unplug the printer's power cord from the wall outlet and disconnect the printer cable.
2. Remove the forms.
3. Remove the forms rack. (2180)
4. Remove the access cover. (2150)
5. Remove the top cover. (2155)
6. Remove the power transformer. (2250) (2260)
7. Remove the fuse-filter card/power cord. (2200) (2210)
8. Remove the control circuit card. (2120)
9. Remove the print mechanism assembly. (2285)
10. Lift the heat sink assembly **A** from the base cover.



Heat Sink/Power Transistor Assembly Replacement 2225

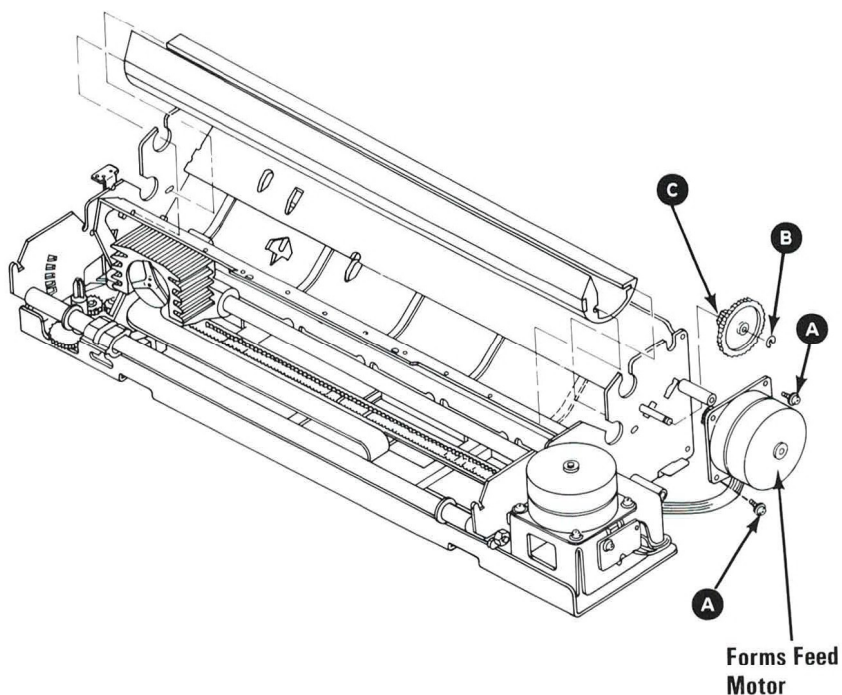
1. Install the heat sink/power transistor assembly **A** on the base cover.
2. Install the print mechanism assembly. (2290)
3. Install the control circuit card. (2125)
4. Install the driver circuit card. (2135)
5. Install the fuse-filter card/power cord. (2205) (2215)
6. Install the power transformer. (2255) (2265)
7. Install the top cover. (2160)
8. Install the access cover. (2150)
9. Install the forms rack. (2180)



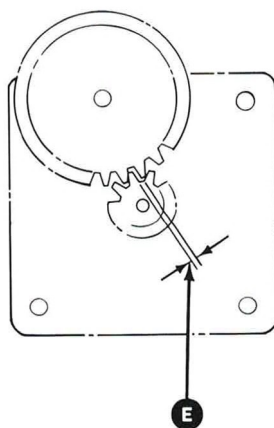
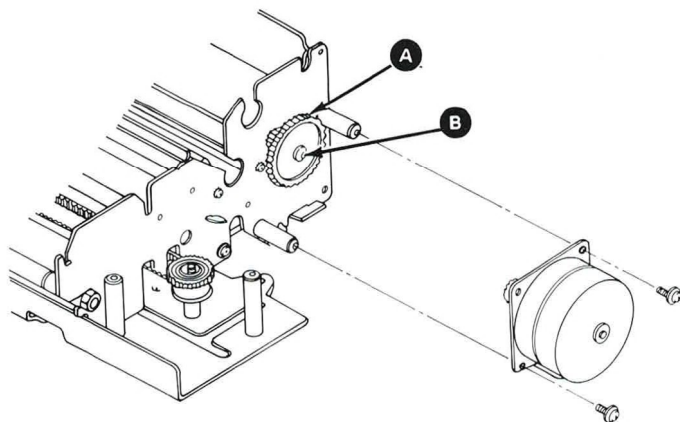
Intermediate Gear Removal 2230

1. Set the printer's Power switch to Off; unplug the printer's power cord from the wall outlet and disconnect the printer cable.
2. Remove all forms.
3. Remove the forms rack. (2180)
4. Remove the access cover. (2150)
5. Remove the top cover. (2155)

6. Remove the two screws **A** from the forms feed motor mounts.
7. Remove the intermediate gear retaining clip **B**.
8. Slide the intermediate gear **C** from the shaft.



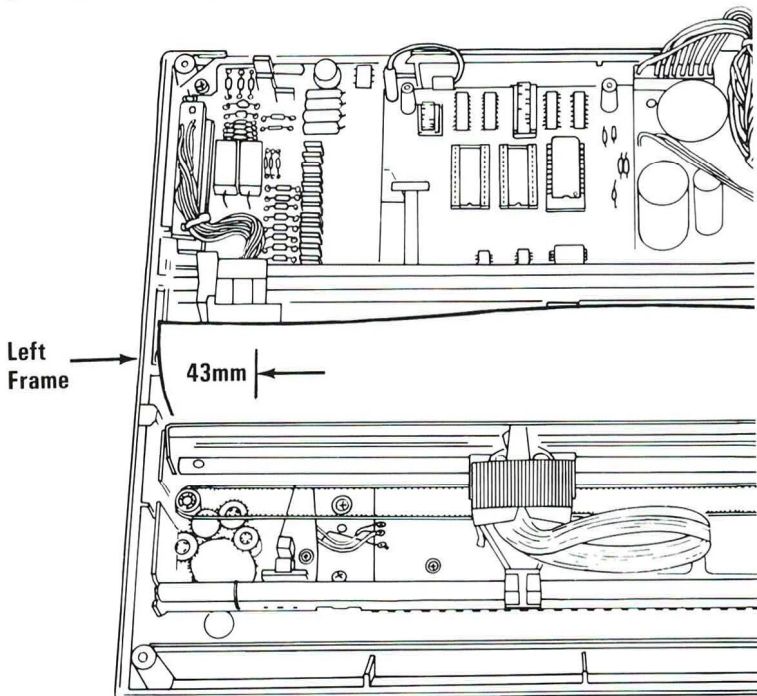
1. Slide the intermediate gear **A** onto the shaft.
2. Install the retaining clip **B**.
3. Adjust the forms feed motor to mesh gears with minimum backlash **E** and no binding.
4. Tighten the two screws.



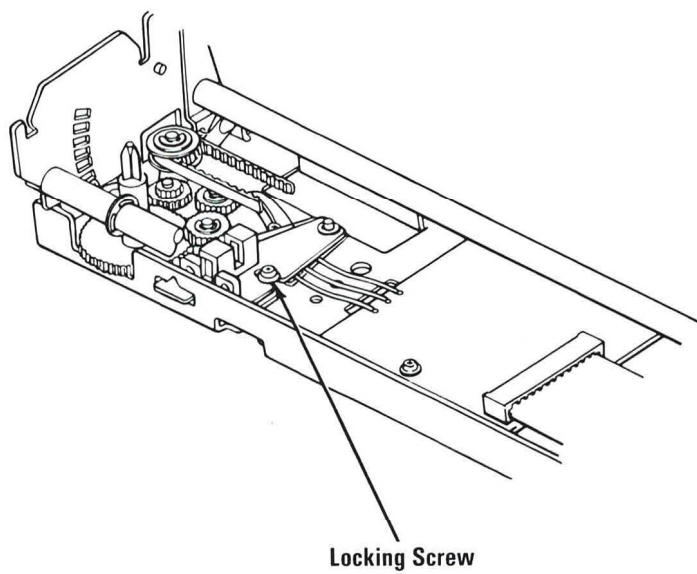
5. Install the top cover. (2160)
6. Install the access cover. (2150)
7. Install the forms rack. (2180)

Left Margin Sensor Adjustment

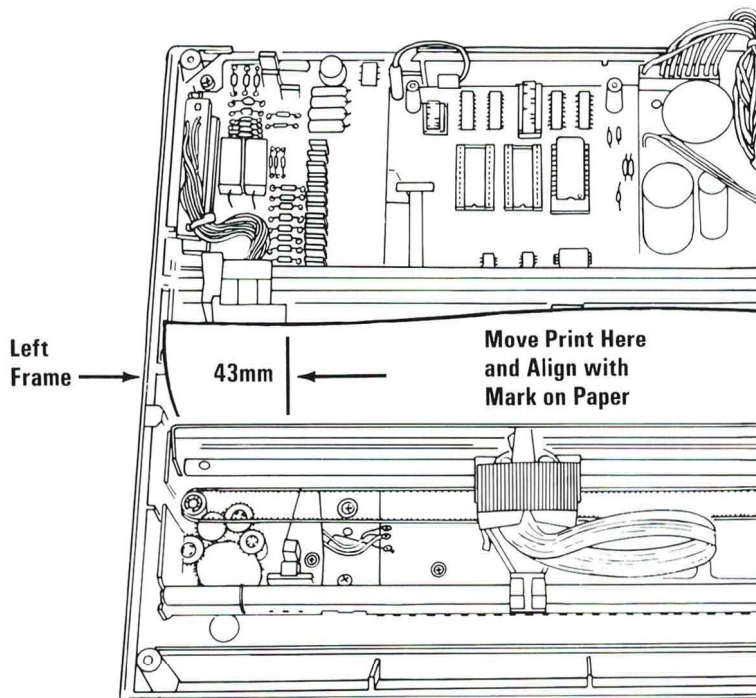
1. Set the printer's Power switch to Off; unplug the printer's power cord from the wall outlet and disconnect the printer cable.
2. Remove the forms.
3. Remove the forms rack. (2180)
4. Remove the access cover. (2150)
5. Remove the top cover. (2155)
6. Remove the ribbon cartridge.
7. Insert a sheet of paper into the printer. Move the paper to the left frame.
8. Measure 43 mm (1-3/4 in.) from the left frame and mark the position on the paper.



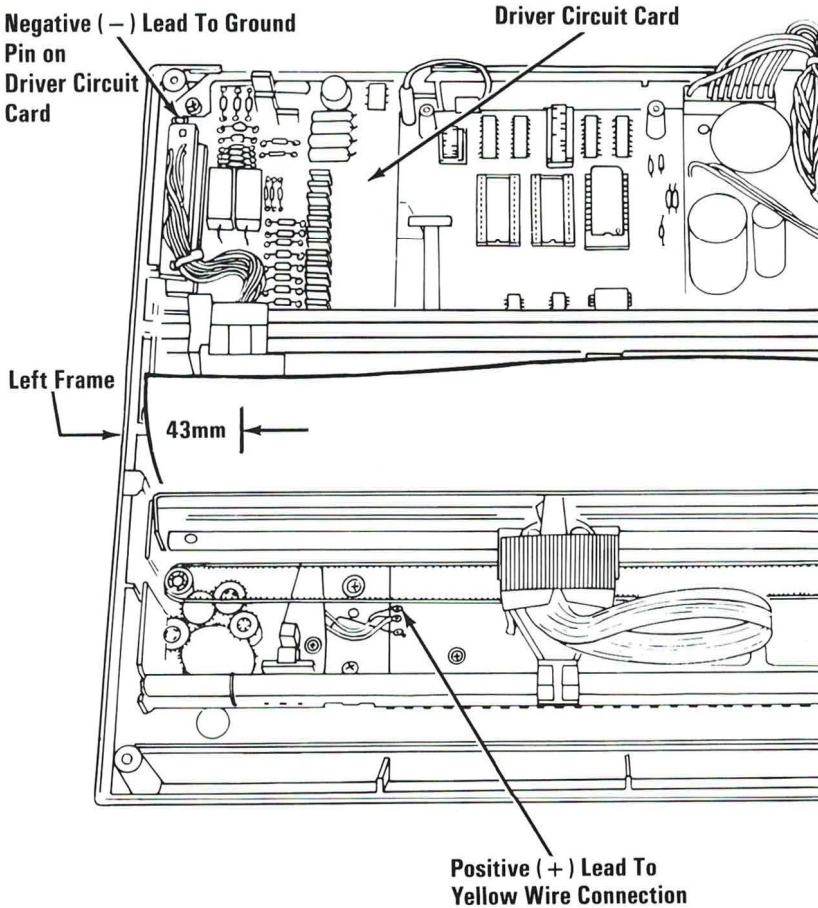
9. Loosen the left-margin sensor's locking screw.



10. Plug in the printer's power cord. Set the printer's Power switch to On.
11. Move the print head manually and align it with the 43 mm (1-3/4 in.) mark on the paper.



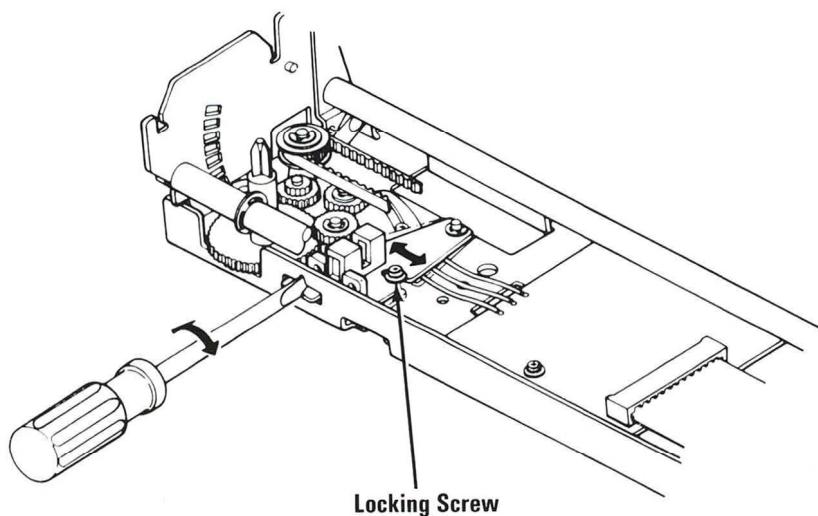
12. Set your multimeter to the 12-Vdc scale.
13. Place the negative (-) lead of the meter on the ground pin of the driver circuit card.
14. Place the positive (+) lead of the meter on the yellow wire's solder connection on the left-margin sensor.



15. Move the left-margin sensor to the left until the voltage reading on the meter is a down level (approximately 0 Vdc).
16. Move the left-margin sensor to the right until the voltage on the meter is an up level (approximately 5 Vdc).

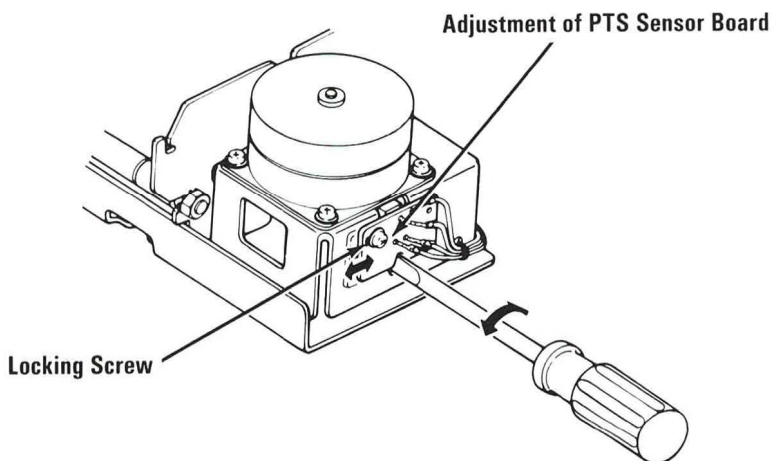
Note: If the voltage reading on the meter stays at a down level, move the print head one position to the left and repeat Steps 15 and 16.

17. Tighten the left-margin sensor's locking screw.

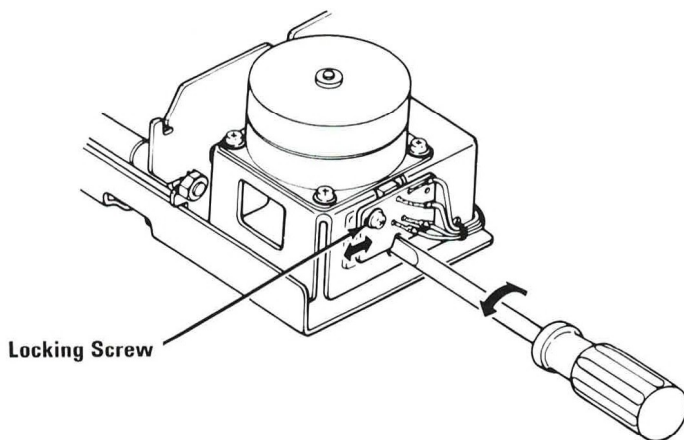


18. Place the positive (+) lead of the meter on the yellow wire's solder connection on the printer timing sensor (PTS) board.
19. Loosen the PTS board's locking screw.
20. Move the PTS board either way until the voltage reading is an up level (approximately 5 Vdc).
21. Move the print head slightly to the left. The voltage reading should drop to a down level (approximately 0 Vdc). Do not allow the print head to step to the next detent position.
22. Move the print head slightly to the right. The voltage reading should drop to a down level (approximately 0 Vdc).

Note: The amount of pressure exerted on the print head must be equal in either direction when the meter reading drops to the down level, without causing the print head to jump to the next detent position.



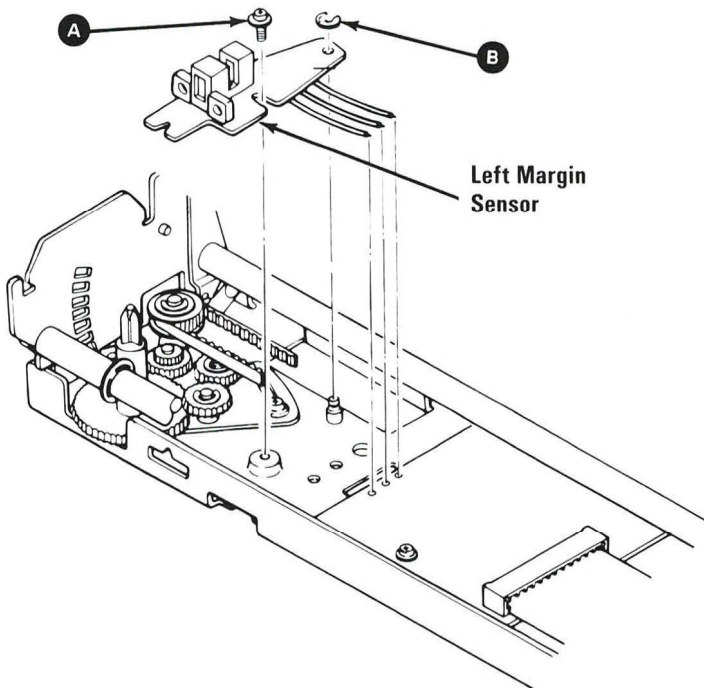
23. Tighten the PTS board's locking screw and recheck Step 21. Realign if necessary.
24. Do the "Printer Offline Diagnostic Test" and observe the speed in both directions.
25. If the buzzer sounds, the PTS board is set incorrectly. Repeat the procedure from step 18.
26. If the speed is different between forward and reverse printing, perform the following steps:
 - a. Place the positive (+) lead of the voltmeter on the yellow wire's solder connection on the PTS board.
 - b. Loosen the PTS board's locking screw.
 - c. Move the PTS board until another up-level location is observed, then repeat the procedure from Step 21.
27. If the speed is the same in both directions, the adjustment is complete.



Left-Margin Sensor Removal 2240

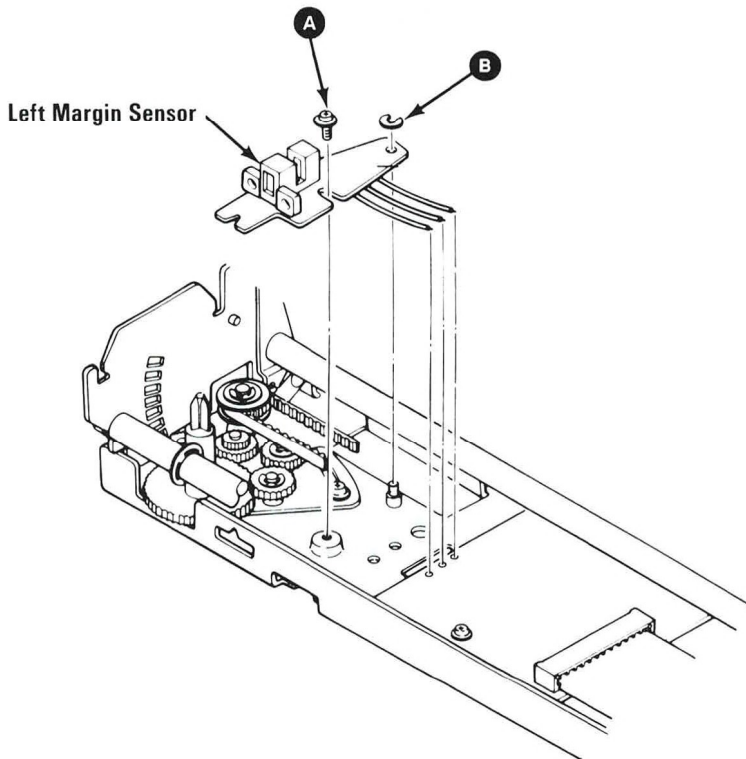
1. Set the printer's Power switch to Off; unplug the printer's power cord from the wall outlet and disconnect the printer cable.
2. Remove the forms.
3. Remove the forms rack. (2180)
4. Remove the access cover. (2150)
5. Remove the ribbon cartridge.
6. Remove the top cover. (2155)

7. Move the carriage to the right frame.
8. Remove the retaining screw **A** and the retaining clip **B**.
9. Unsolder the three wires from the left-margin sensor.
10. Lift the left-margin sensor from the printer.



Left-Margin Sensor Replacement 2245

1. Solder the three wires from the terminal board to the left margin sensor.
2. Place the left-margin sensor's pivot hole over the post.
3. Install the retaining screw **A** and the retaining clip **B**.
4. Readjust the left-margin sensor.



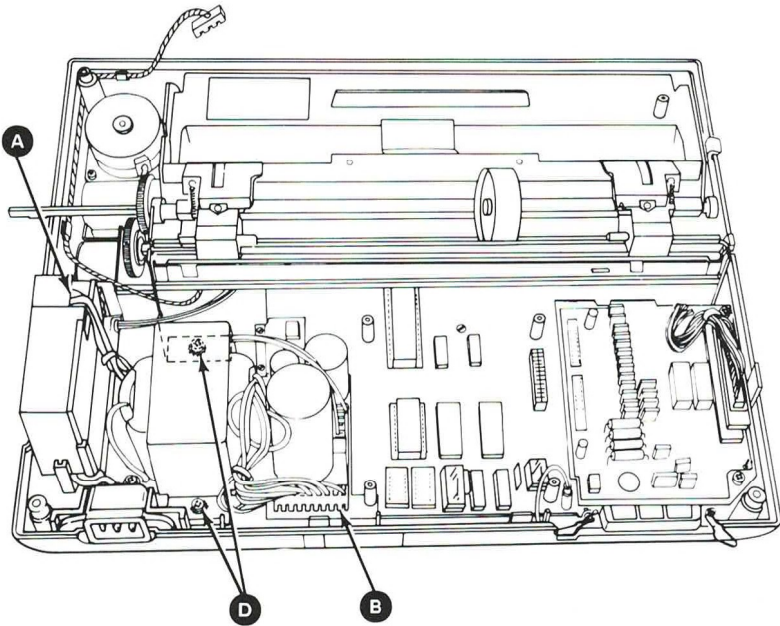
5. Install the top cover. (2160)
6. Install the ribbon cartridge.
7. Install the access cover. (2150)
8. Install the forms rack. (2180)

Power Transformer Removal--220/240 Volt 2250

1. Set the printer Power switch to Off; unplug the printer power cord from the wall outlet and disconnect the printer cable.
2. Remove the forms.
3. Remove the forms rack. (2180)
4. Remove the access cover. (2150)
5. Remove the top cover. (2155)

DANGER
STATIC VOLTAGE MAY BE PRESENT ON THE
FUSE-FILTER CARD. USE CAUTION IN THIS
AREA.

6. Remove the safety shield. (2305)
7. Unplug the connector **A** from the fuse-filter card.
8. Unplug the connector **B** from the control circuit card.
9. Remove the two screws **D** from the base of the transformer.
10. Lift the transformer from the base.

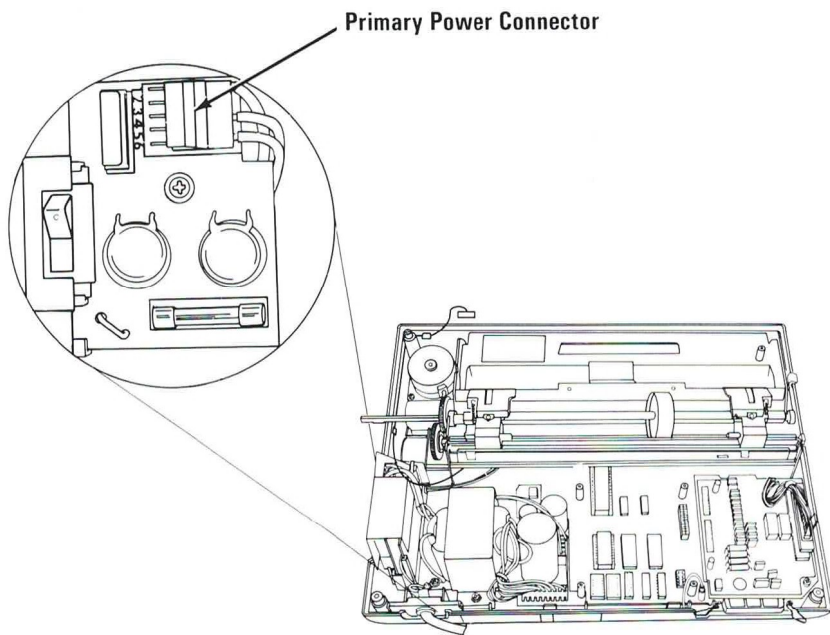


Power Transformer, 220/240-Volt, Primary Power Connector Wiring Check

Before replacing the power transformer, check the new one for proper wiring.

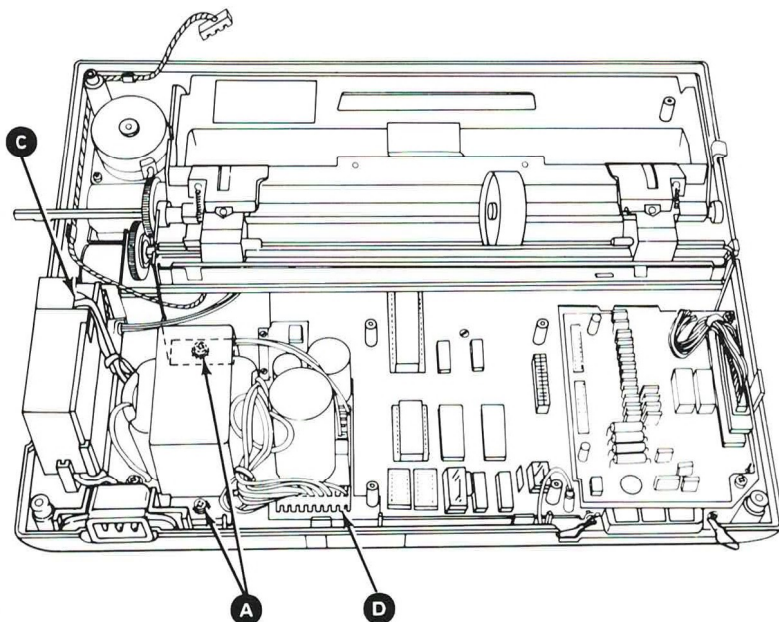
A 220-volt transformer must have a white wire in primary power connector pin 1 and a brown wire in pin 4. The orange wire is stored in pin 6.

For 240-volt installations, the primary power connector must have a white wire in pin 1 and an orange wire in pin 4. The brown wire is stored in pin 6.



Power Transformer Replacement--220/240 Volt 2255

1. Place the transformer on its base in the area next to the fuse-filter card (notice the positions of the two connectors).
2. Install the two base mounting screws **A**.
3. Plug the connector **C** into the fuse-filter card.
4. Plug the connector **D** into the control circuit card.
5. Install the safety shield. (2305)
6. Install the top cover. (2160)
7. Install the access cover. (2150)
8. Install the forms rack. (2180)

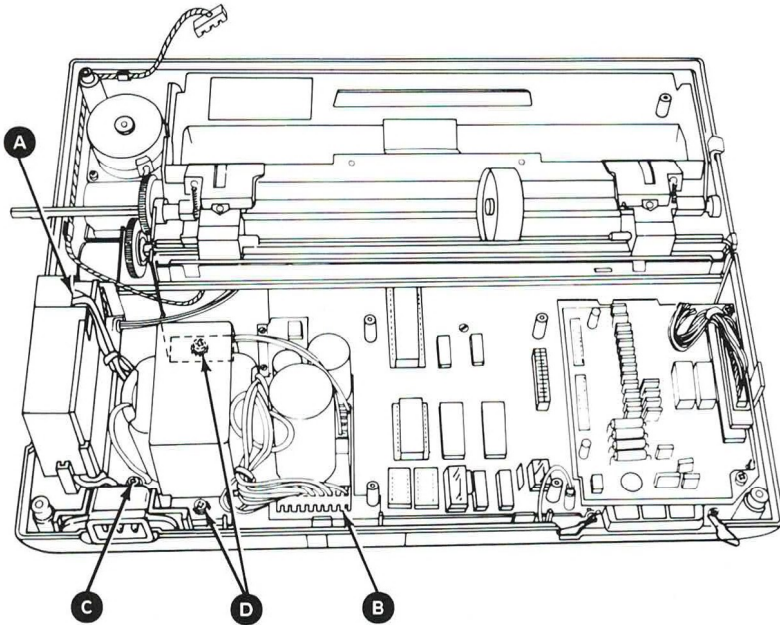


Power Transformer Removal--120 Volt 2260

1. Set the printer's Power switch to Off; unplug the printer's power cord from the wall outlet and disconnect the printer cable.
2. Remove the forms.
3. Remove the forms rack. (2180)
4. Remove the access cover. (2150)
5. Remove the top cover. (2155)

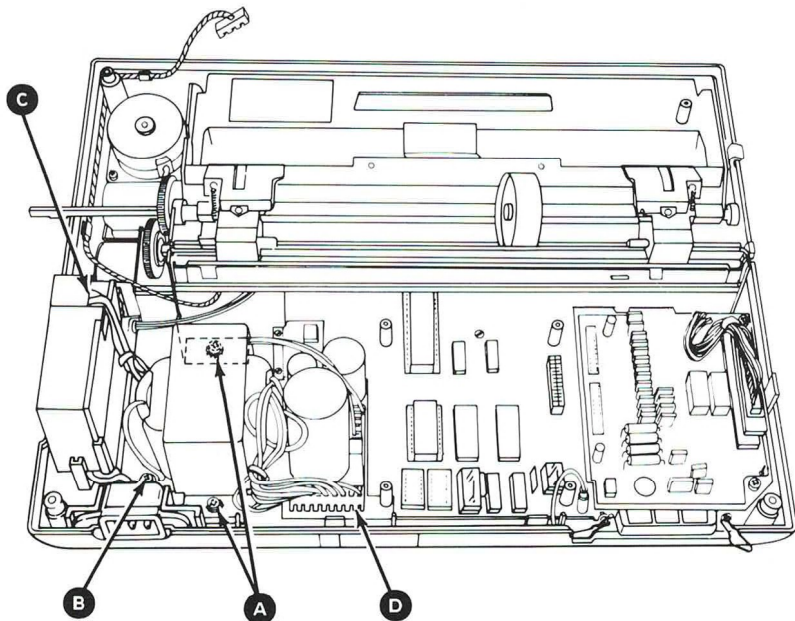
DANGER
STATIC VOLTAGE MAY BE PRESENT ON THE
FUSE-FILTER CARD. USE CAUTION IN THIS
AREA.

6. Unplug the connector **A** from the fuse-filter card.
7. Unplug the connector **B** from the control circuit card.
8. Remove the screw **C** from the transformer ground wire (if attached).
9. Remove the two screws **D** from the base of the transformer.
10. Lift the transformer from its base.



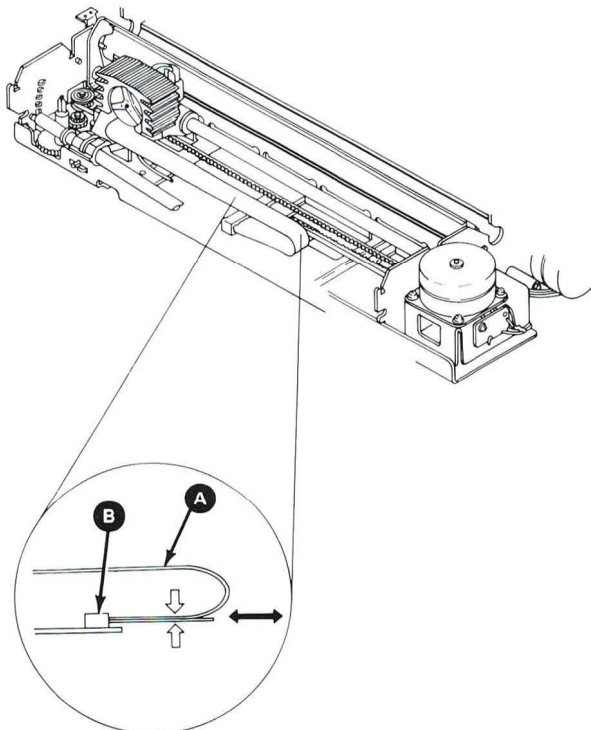
Power Transformer Replacement--120 Volt 2265

1. Place the transformer on its base in the area next to the fuse-filter card (notice the positions of the two connectors).
2. Install the two base mounting screws **A**.
3. Install the screw in the ground wire **B** if attached.
4. Plug the connector **C** into the fuse-filter card.
5. Plug the connector **D** into the control circuit card.
6. Install the top cover. (2160)
7. Install the access cover. (2150)
8. Install the forms rack. (2180)

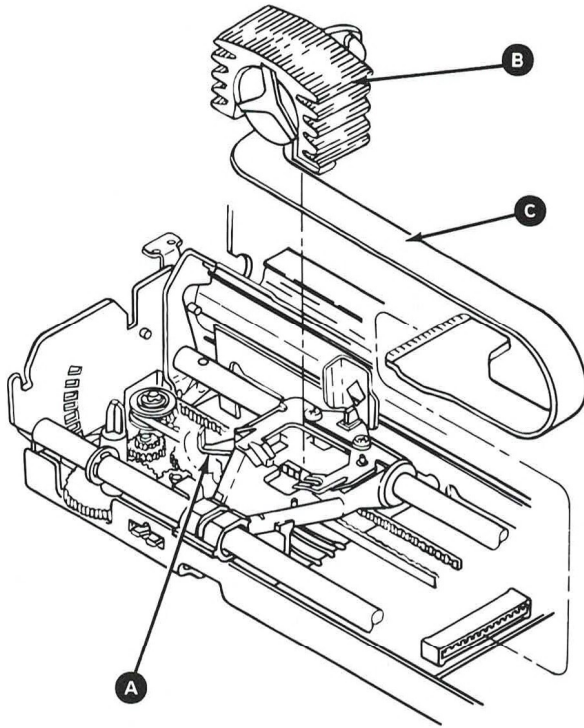


Print Head Removal 2270

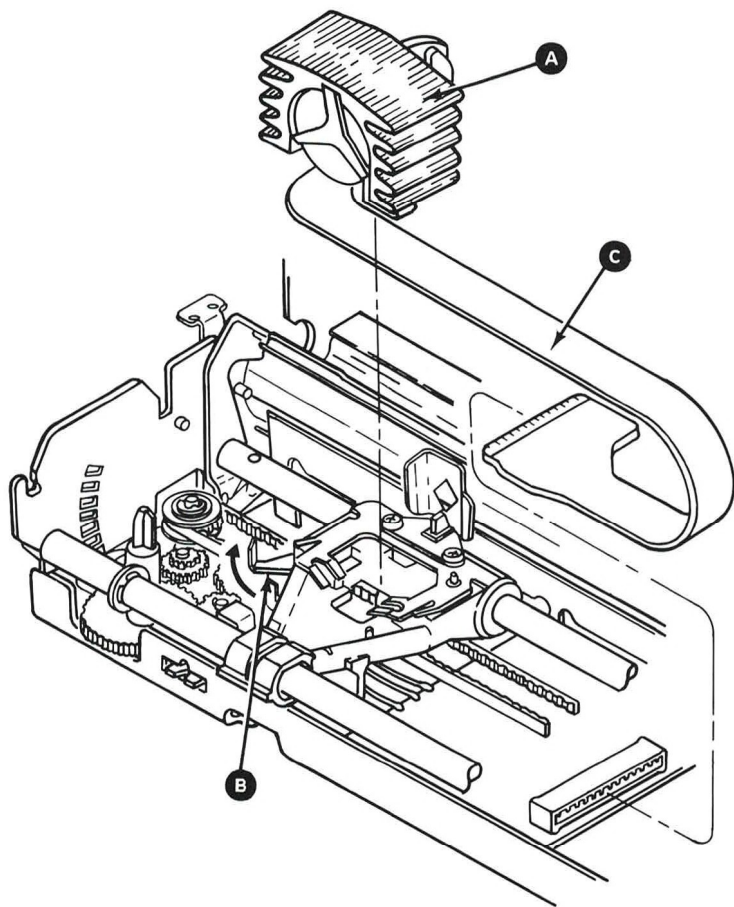
1. Set the printer's Power switch to Off; unplug the printer's power cord from the wall outlet and disconnect the printer cable.
2. Remove the forms.
3. Remove the forms rack. (2180)
4. Remove the access cover. (2150)
5. Remove the ribbon cartridge.
6. Remove the top cover. (2155)
7. Pull the print head cable **A** from its connector **B**.



8. Pivot the print head's lock lever **A** clockwise.
9. Lift the print head **B** and cable **C** from the carriage.



1. Insert the feet **A** on the print head into the opening on the carriage.
2. Pivot the lock lever **B** counterclockwise while pressing down on the print head.
3. Connect the print-head cable **C** to the connector.



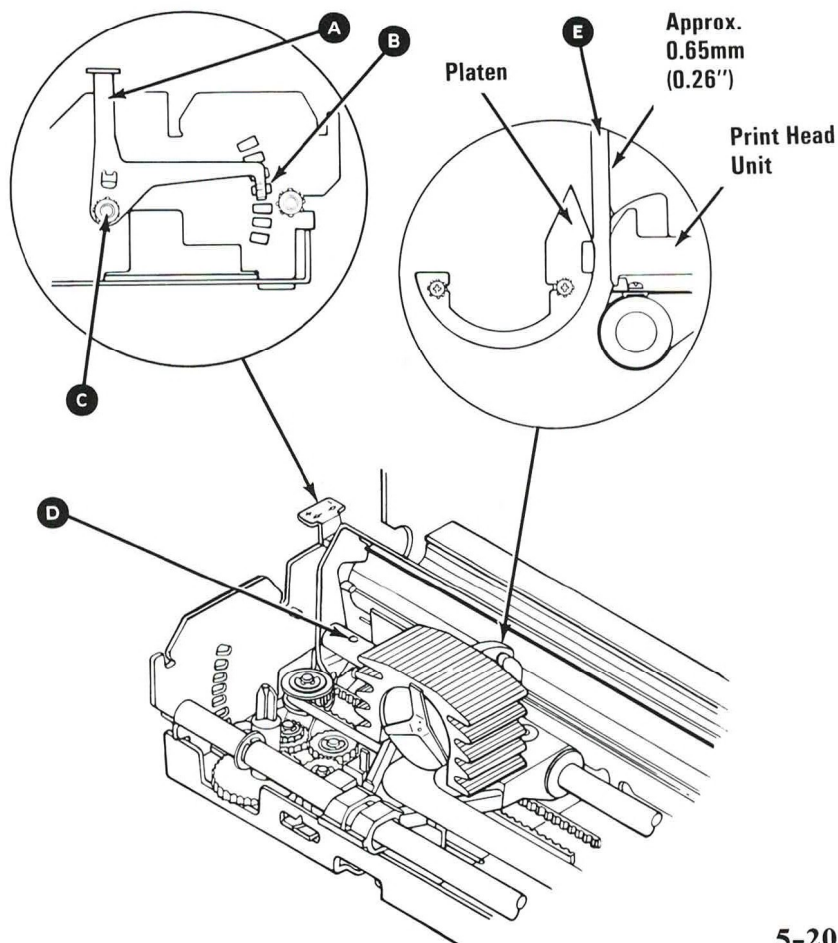
4. Install the top cover. (2160)
5. Install the ribbon cartridge.
6. Install the access cover. (2150)
7. Install the forms rack. (2180)

Note: Broken wires may be the result of other problems. If a print head has been replaced because of a broken wire, perform the following steps to prevent damaging the newly installed print head.

1. Remove the top cover. Disconnect CN6 on the driver control card. Check for 22 ohms resistance between pin CN6-10 (male end) and pins CN6-1 through 9. Replace the print mechanism assembly if there are any shorts or opens.
2. Switch power on. Check for +24 Vdc at pins CN6-1 through 9 on the driver card (use ground pin for common lead). If any pin has +24 Vdc, replace the control cards. If all pins read 0 Vdc, switch power off and reconnect CN6. The print head circuitry is functional.

Print Head Gap Adjustment 2280

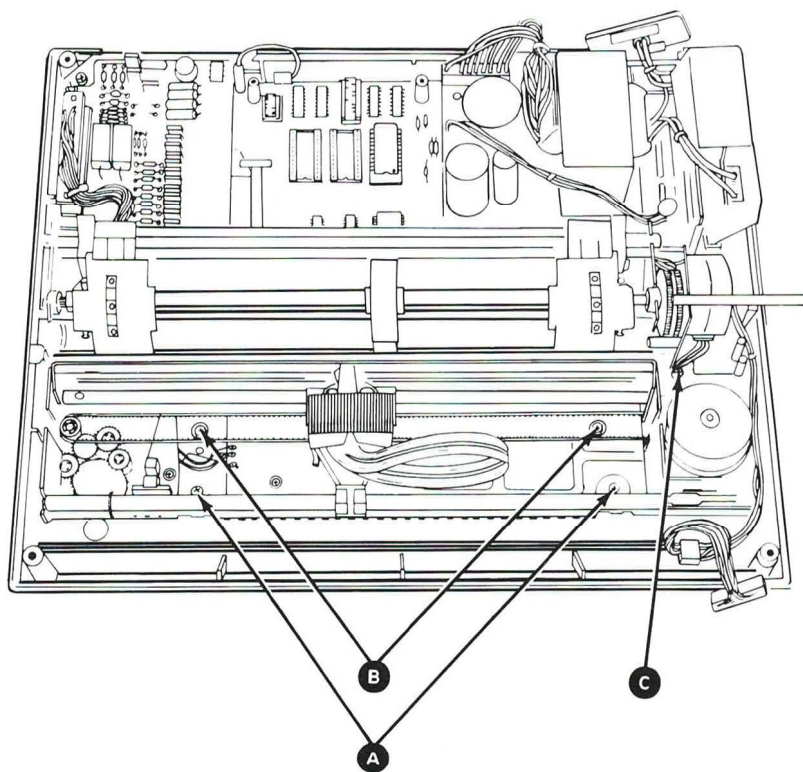
1. Remove the print mechanism assembly. (2285)
2. Set the print head gap-adjusting lever **A** to the fourth position **B**.
3. Loosen the nut **C**.
4. Rotate the carriage shaft **D** to obtain 0.65 mm (0.26 in.) gap between the print head and the platen **E**.
5. Tighten the nut **C**.
6. Install the print mechanism assembly. (2290)



Print Mechanism Assembly Removal 2285

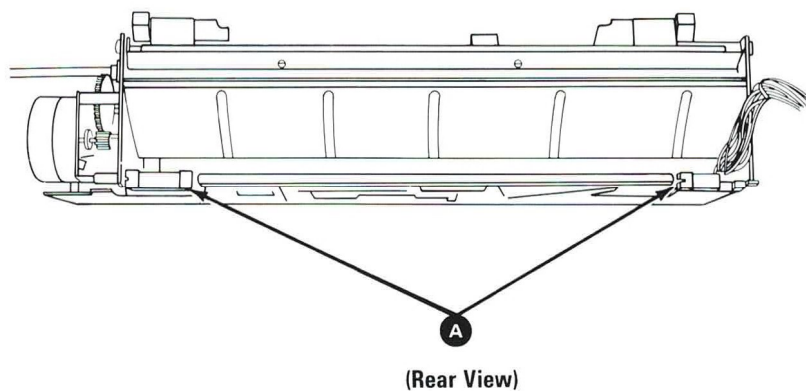
1. Set the printer's Power switch to Off; unplug the printer's power cord from the wall outlet and disconnect the printer cable.
2. Remove all forms.
3. Remove the forms rack. (2180)
4. Remove the access cover. (2150)
5. Remove the ribbon cartridge.
6. Remove the top cover. (2155)
7. Remove the driver circuit card. (2130)
8. Remove the control circuit card. (2120)

9. Remove the two screws **A** from the base unit of the print mechanism assembly.
10. Remove the shipping screws **B** if they are still installed.
11. Remove the screw **C** from the ground strap.
12. Lift the print mechanism assembly from the base cover.

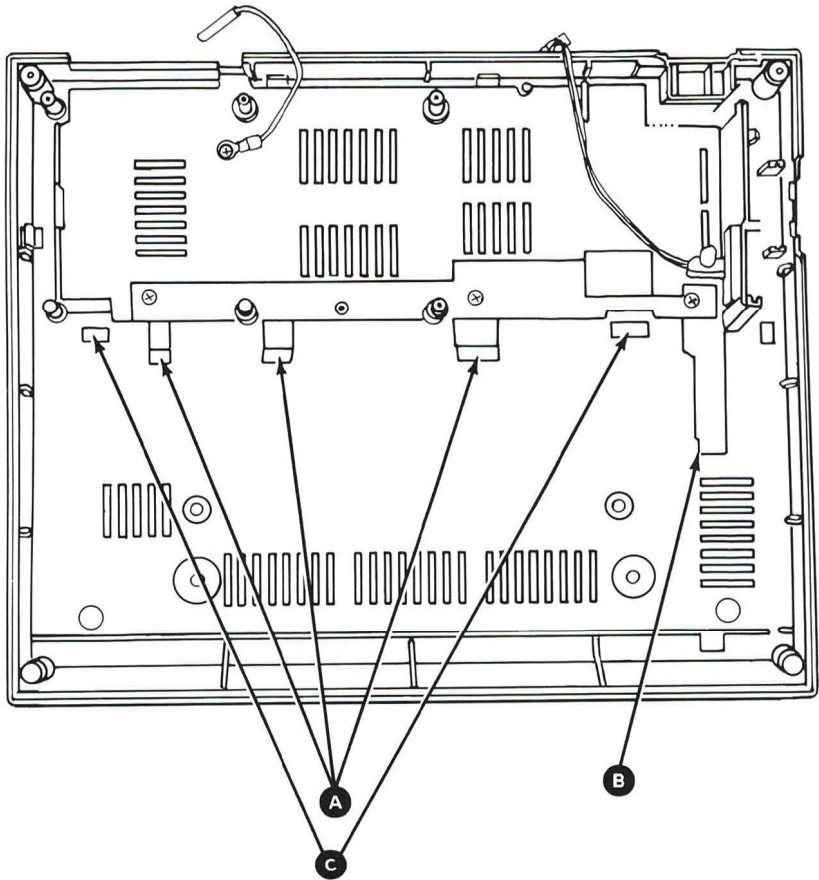


Print Mechanism Assembly Replacement 2290

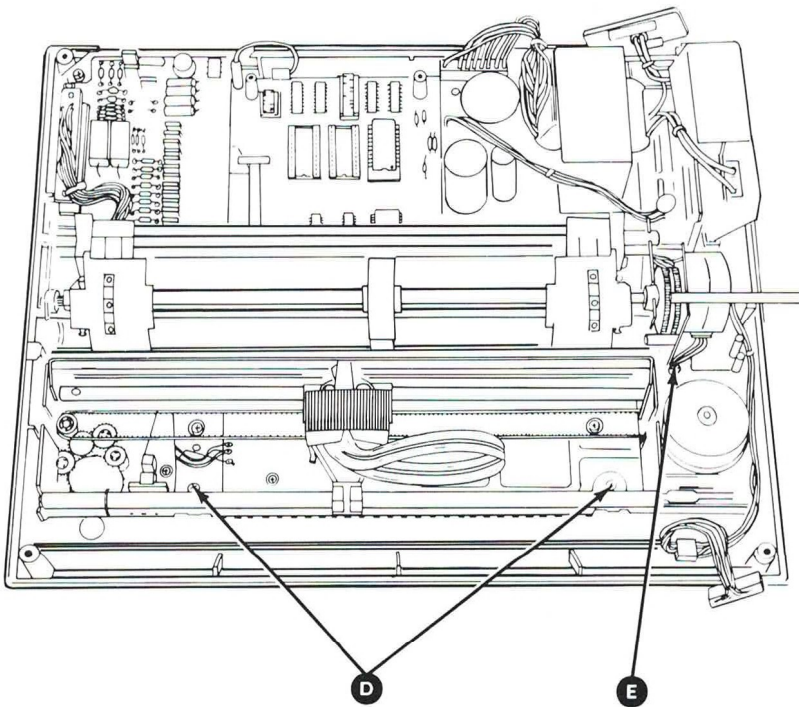
1. Verify that the rubber grommets **A** are in the position shown.



2. Place the print mechanism assembly on the base cover.
3. Slide the print mechanism assembly toward the rear over the three grounding tabs **A** and under the ground strap **B**.
4. Place the rubber grommets around the plastic stops **C**.

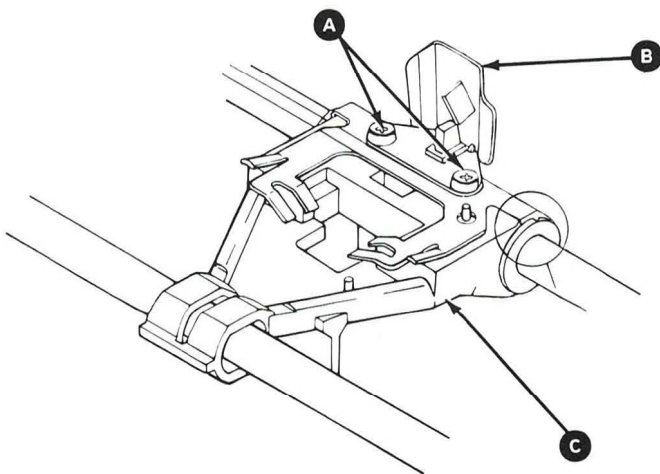


5. Install the two screws **D**.
6. Install the screw **E** in the ground strap.
7. Install the control circuit card. (2125)
8. Install the driver circuit card. (2135)
9. Install the top cover. (2160)
10. Install the ribbon cartridge.
11. Install the access cover. (2150)
12. Install the forms rack.



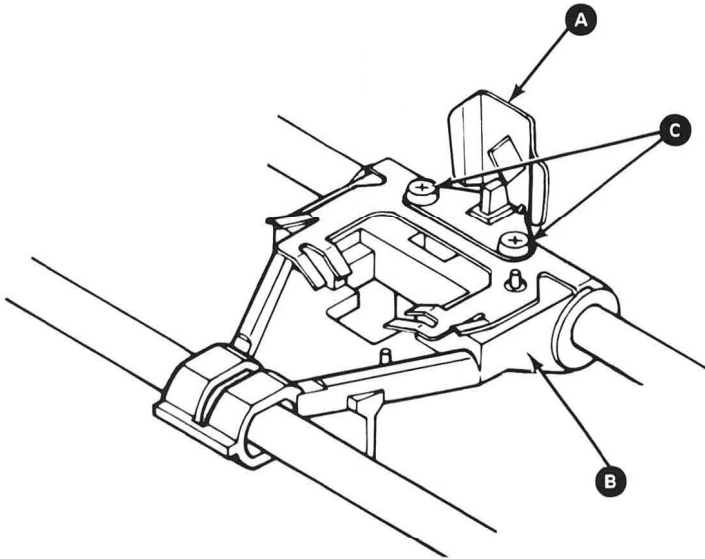
Ribbon Shield Removal 2295

1. Set the printer's Power switch to Off; unplug the printer's power cord from the wall outlet and disconnect the printer cable.
2. Remove all forms.
3. Remove the forms rack. (2180)
4. Remove the ribbon cartridge.
5. Remove the access cover. (2150)
6. Remove the top cover. (2155)
7. Remove the print head. (2270)
8. Remove the two screws **A** at the base of the ribbon shield **B**.
9. Lift the shield straight up from the carriage **C**.

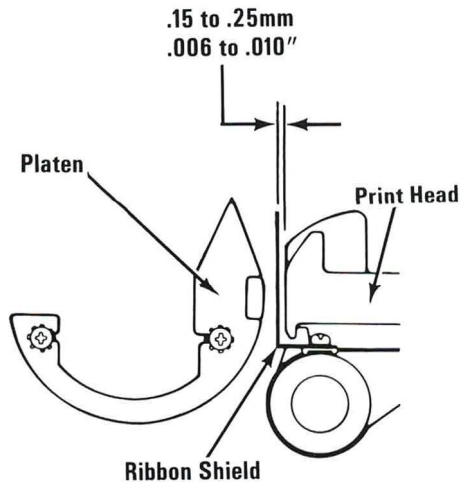
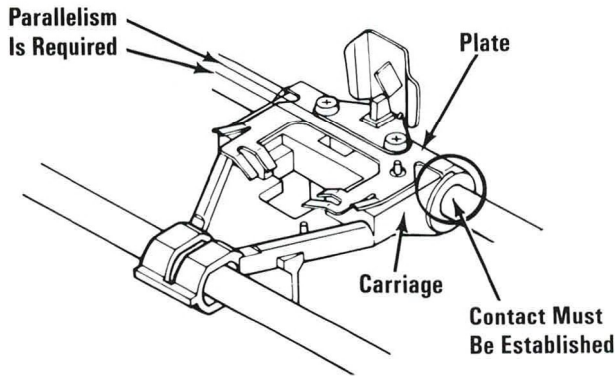


Ribbon Shield Replacement 2300

1. Place the shield **A** and the plate **B** on the print head carriage.
2. Insert the screws **C**, but do not tighten.



3. Place the shield and plate as shown. Tighten the screws.
4. Install the print head. (2275)
5. Install the top cover. (2160)
6. Install the ribbon cartridge.
7. Install the access cover. (2150)
8. Install the forms rack. (2180)

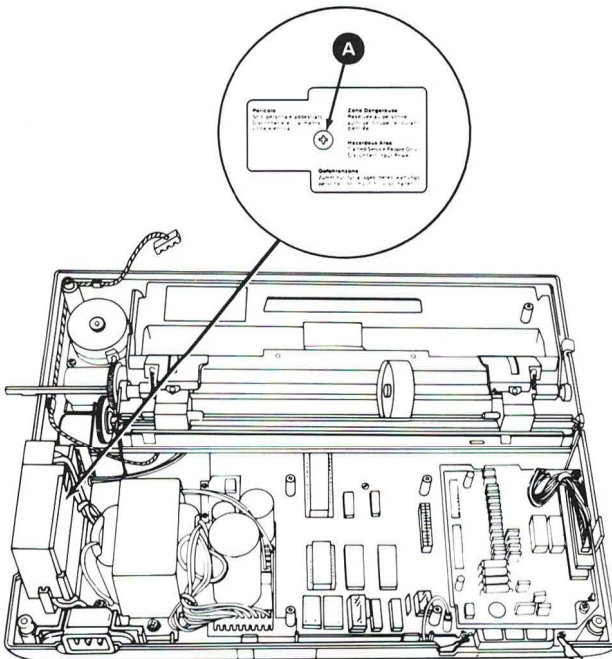


Safety Shield Removal 2305

1. Set the printer's Power switch to Off; unplug the printer's power cord from the wall outlet and disconnect the printer cable.
2. Remove all forms.
3. Remove the forms rack. (2180)
4. Remove the access cover. (2150)
5. Remove the top cover. (2155)

DANGER
STATIC VOLTAGE MAY BE PRESENT ON THE
FUSE-FILTER CARD. USE CAUTION IN THIS
AREA.

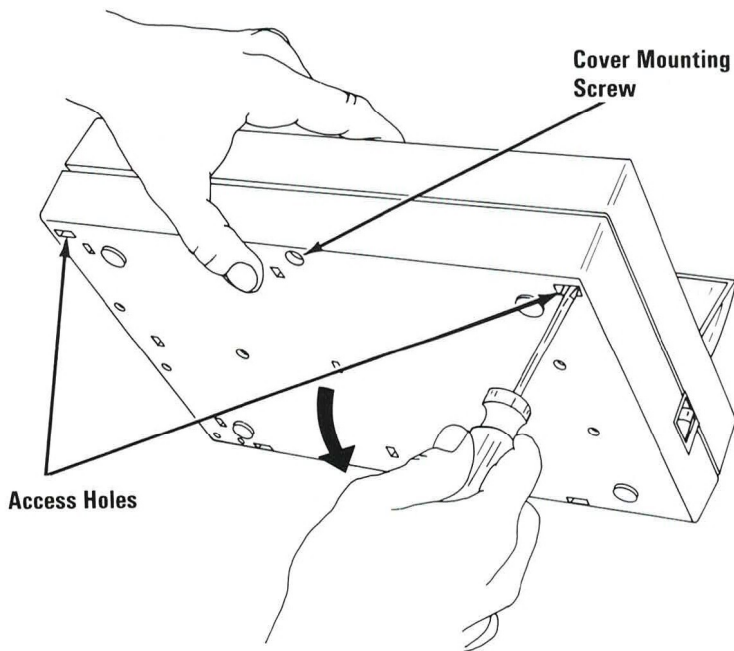
6. Loosen the screw **A**.
7. Lift the safety shield from the fuse-filter card.



Compact Printer

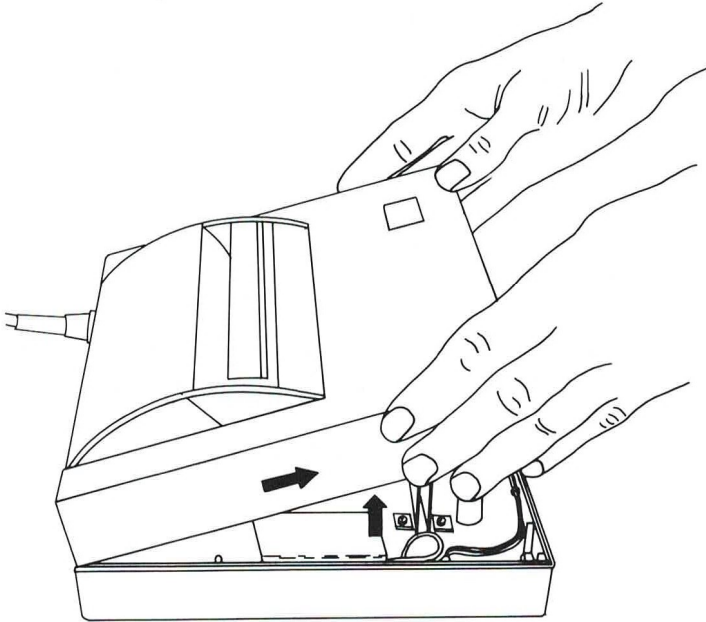
Top Cover Removal 6000

1. Set the printer's Power switch to Off; unplug the printer's power cord from the wall outlet and disconnect the printer cable.
2. Remove any paper.
3. Tilt the printer up, and remove the cover mounting screw.
4. Insert a flat bladed screwdriver through one of the two access holes in the bottom cover.
5. Gently pry down on the screwdriver, and begin to separate the covers. Then, repeat this action on the other side.
6. Return the printer to its operating position.

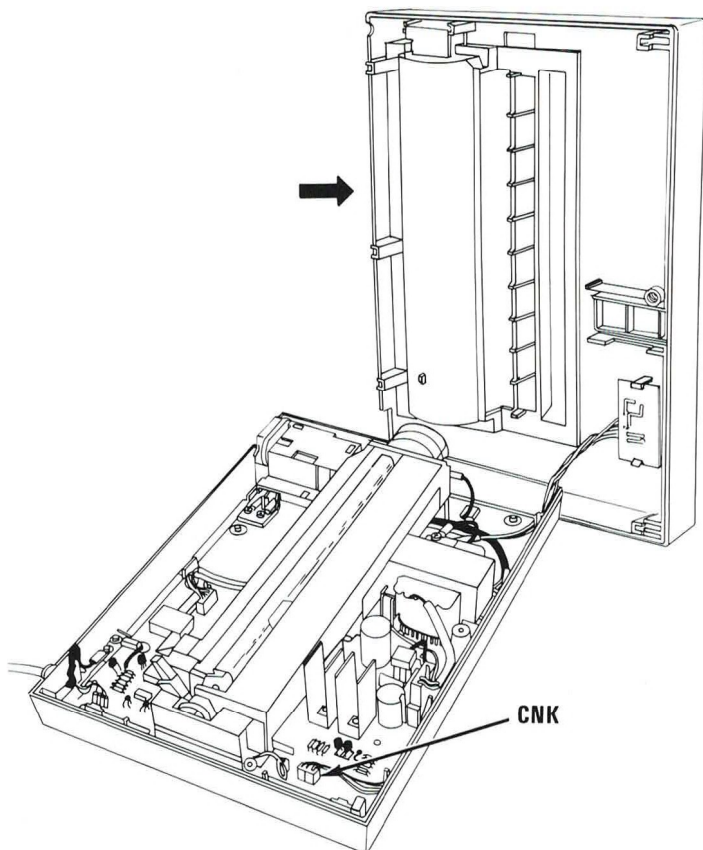


7. Lift the front of the top cover up, and slide it toward the front of the printer to separate it from the bottom cover.

Note: The control panel is attached by a cable inside the printer. Note how the cable is routed so it can be routed correctly during reassembly.

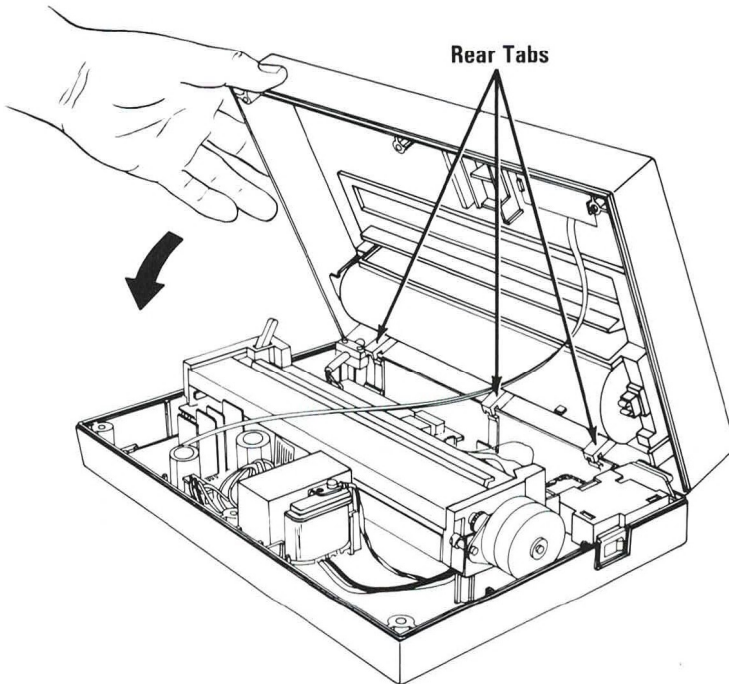


8. When the covers are separated, set the top cover off to the side and disconnect the CNK connector (control panel cable) from the logic card.



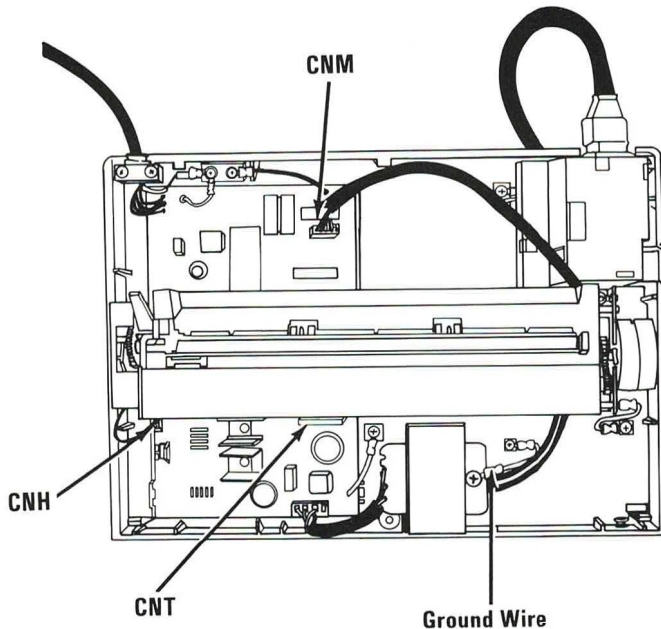
Top Cover Replacement 6005

1. Connect the CNK connector (control panel cable).
2. Set the rear of the top cover onto the bottom cover with the three rear tabs under their latches.
3. Pivot the top cover down until it closes securely.
4. Tilt the printer up, and install the cover mounting screw.
5. Connect the power cord to the printer.



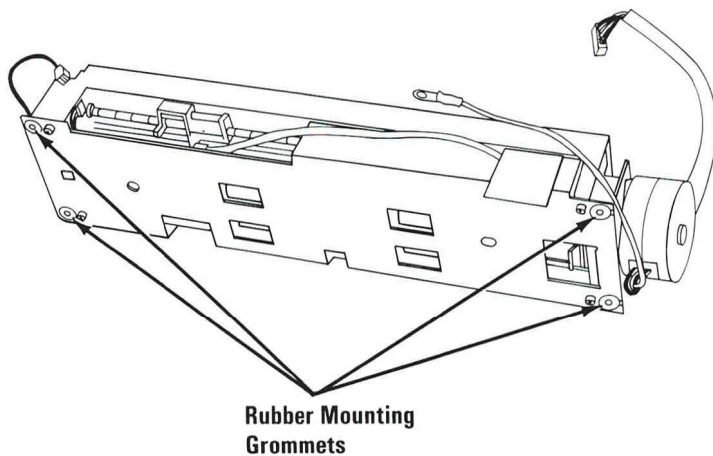
Print Mechanism Removal 6010

1. Set the printer's Power switch to Off.
2. Unplug the printer's power cable from the wall outlet.
3. Remove the printer top cover. (6000)
4. Disconnect the CNH and CNM connectors from the logic card.
5. Lift the print mechanism slightly, and disconnect the CNT connector from the logic card.
6. Remove the ground wire from the grounding plate and lift the print mechanism from the bottom cover.

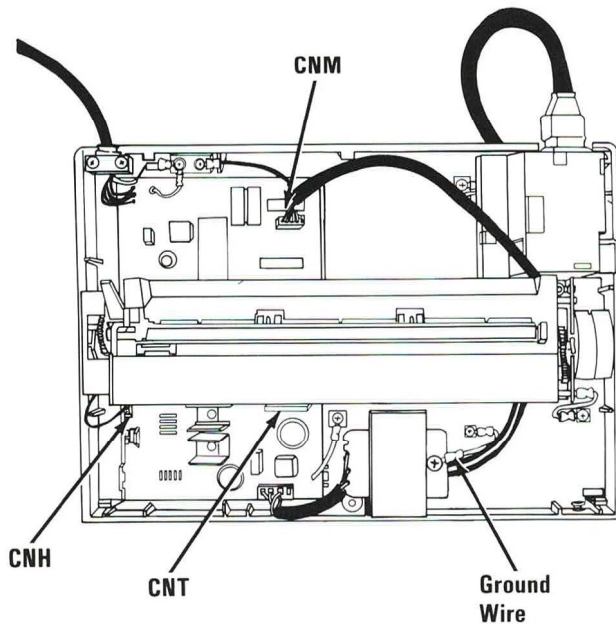


Print Mechanism Replacement 6015

1. Ensure that the rubber mounting grommets are in place, as shown.

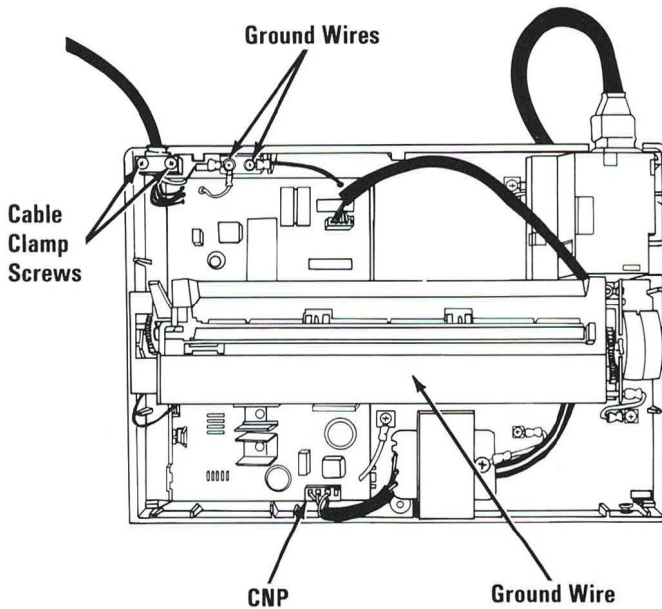


2. Set the print mechanism onto its four mounting studs.
3. Connect the CNH, CNM, and CNT connectors to the logic card.
4. Install the ground wire to the transformer.
5. Install the top cover. (6005)
6. Connect the power cord to the printer.

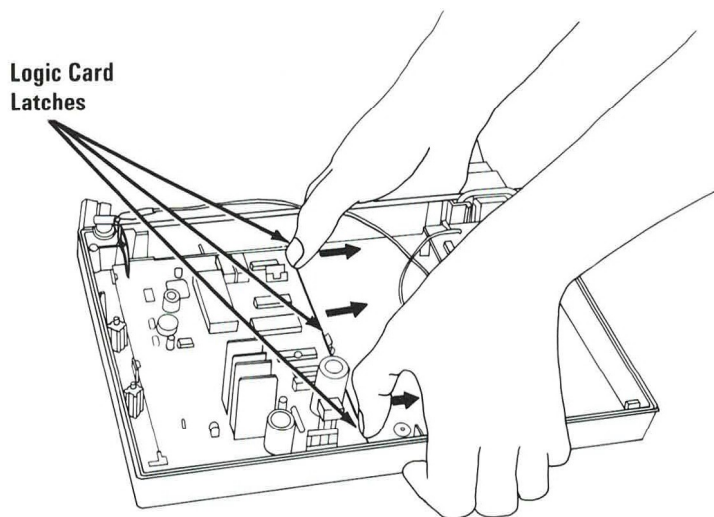


Logic Card Removal 6020

1. Set the printer's Power switch to Off.
2. Unplug the printer's power cord from the wall outlet.
3. Remove the printer top cover. (6000)
4. Remove the print mechanism. (6010)
5. Disconnect the CNP connector.
6. Remove the two screws from the signal cable clamp.
7. Remove the logic card ground wire screws.

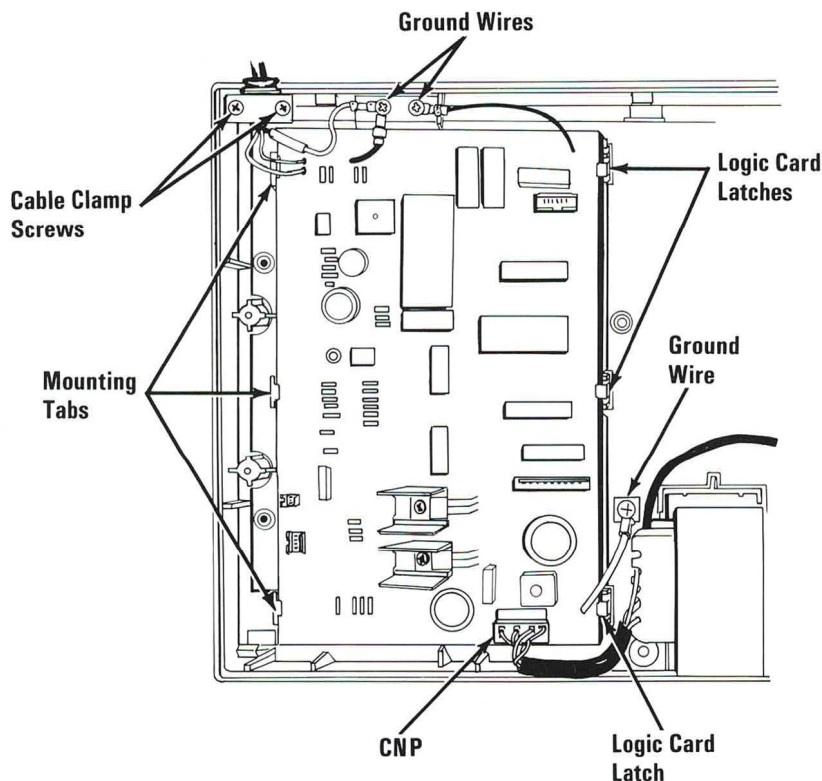


8. Press the three logic card latches away from the logic card, and lift the card out of the bottom cover.



Logic Card Replacement 6025

1. Slide the logic card into its three left hand mounting tabs.
2. Gently push down on the right side of the logic card until the three logic card latches snap into place.
3. Install the two screws through the signal cable clamp, and tighten them into the bottom cover.
4. Install the logic card ground wires and their screws.
5. Connect the CNP connector.
6. Install the print mechanism. (6015)
7. Install the top cover. (6005)



SECTION 6. SWITCH SETTINGS

Contents

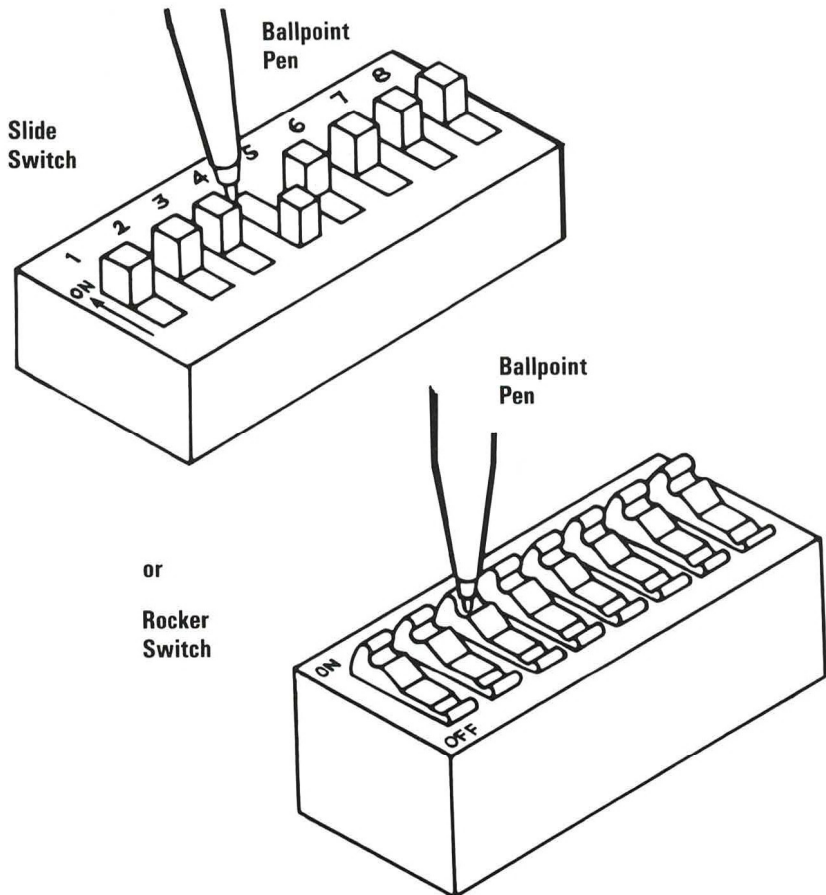
System Board	6-4
Switch 1: POST Mode	6-5
Switch 2: Math Coprocessor	6-6
Switches 3 and 4: System Board Memory	6-7
Switches 5 and 6: Display Type	6-8
Switches 7 and 8: Diskette Drive	6-9
 Extender Card	 6-10
 Memory Expansion Option	 6-11
 Cluster Adapter Switch Settings	 6-12

Notes:

Your system has switches that must be set to specify the characteristics of your system, such as the number of diskette drives, amount of memory, and type of display. These switches; which are dual inline pin (DIP) switches, are on the system board, extender card, and 64/256KB Memory Expansion Option Adapter.

These switches can be easily set with a ballpoint pen. Refer to the figures below to familiarize yourself with the different types of switch block assemblies that may be used in your system.

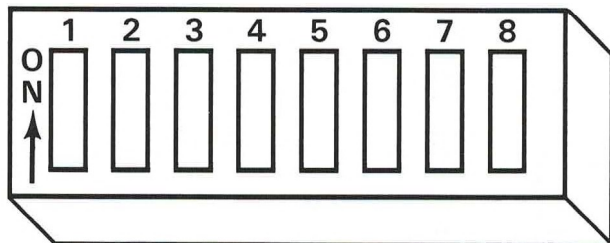
The figures on the following pages show the correct switch settings for your system.



Note: Set a rocker switch by pressing the rocker down to the desired position.

System Board

The system board has one switch block assembly. The functions of the eight switches are shown in the figure below.

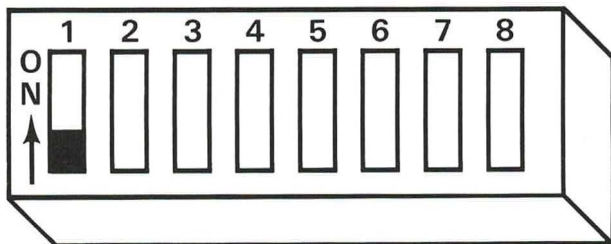


Switch Block Assembly

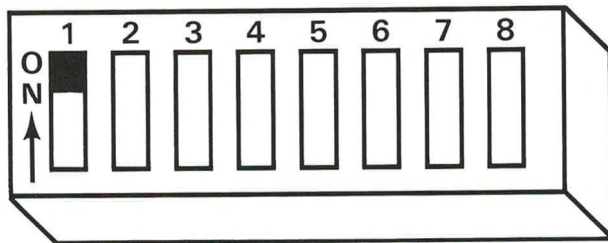
Switch	Function
1	Off for normal operation (set to On for loop POST).
2	Used for Math Coprocessor
3-4	Amount of memory on the system board.
5-6	Type of display you are using.
7-8	Number of diskette drives attached.

Switch 1: POST Mode

Switch 1 is used to set the mode of operation of the POST. When switch 1 is set to On, the POST will run continuously (loop) for diagnostic use. Set switch 1 to Off for normal system operation. The following figures show the settings for switch 1.



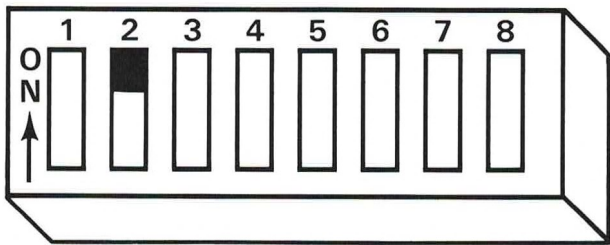
OFF — Normal Operation



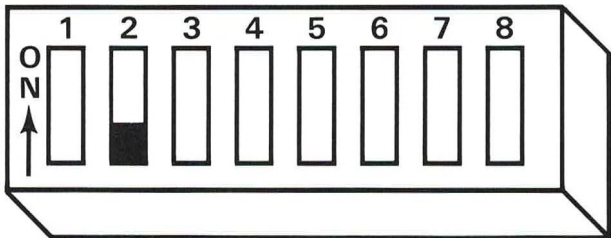
ON — Loop on POST

Switch 2: Math Coprocessor

Switch 2 is set to indicate if the Math Coprocessor is installed in your system unit. The following figures show the settings for switch 2.



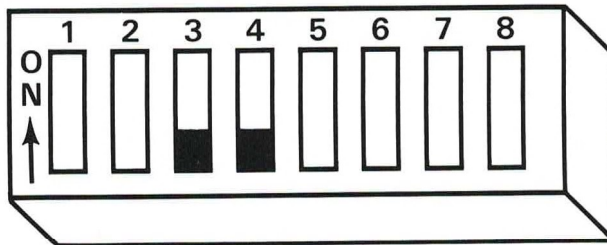
ON – Math Coprocessor not installed



OFF – Math Coprocessor installed

Switches 3 and 4: System Board Memory

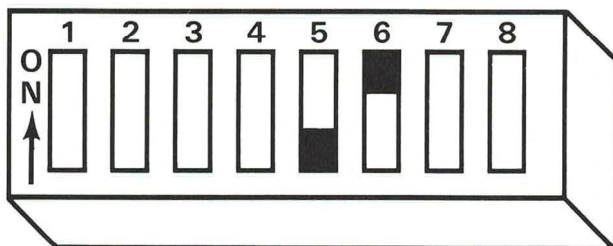
Switches 3 and 4 are set to indicate how much memory is installed on the system board. Refer to the figure below.



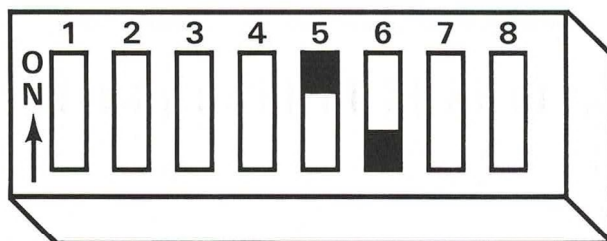
256K

Switches 5 and 6: Display Type

Your system comes with a composite display installed. Switches 5 and 6 must be set to match the following figure.



40 X 25 Color Mode

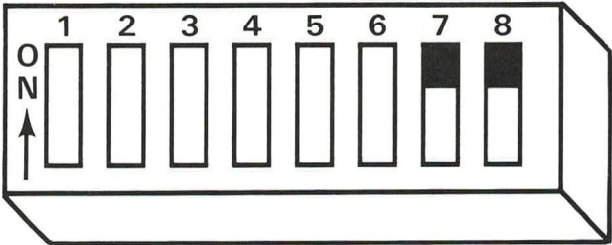


80 x 25 Color Mode

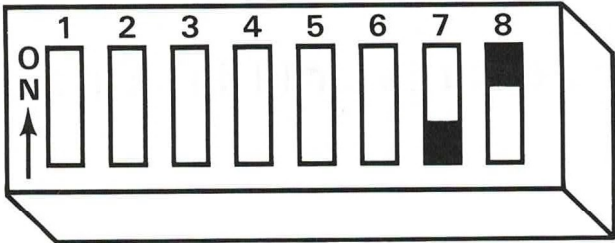
Note: The display-type switch settings, when used with your television and other displays, can cause loss of character quality.

Switches 7 and 8: Diskette Drive

Switches 7 and 8 are set to indicate how many diskette drives are installed in your system. Refer to the figure below.



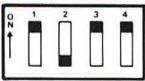
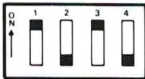
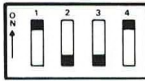
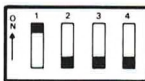
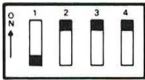
1 Drive



2 Drives

Extender Card

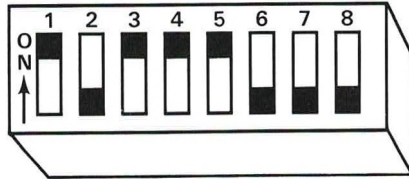
The extender card is installed in the system unit so that you can attach an expansion unit to your system. The four switches on the extender card's switch block are set to indicate the total amount of memory installed in your system. Set these switches as shown in the figure below.

TOTAL MEMORY	SWITCH EXTENDER CARD	MEMORY SEGMENT
256K		4
320K		5
384K		6
448K		7
512K		8

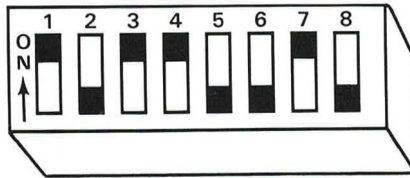
Memory Expansion Option

The eight switch positions on the 64/256KB Memory Expansion Option are set to indicate the total amount of installed memory, as shown below.

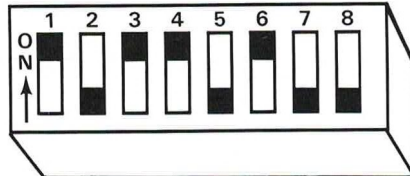
320KB Total Memory



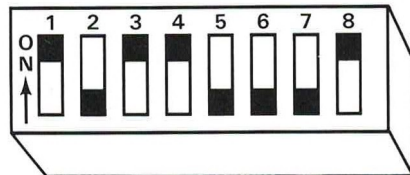
448KB Total Memory



394KB Total Memory



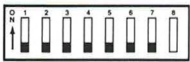

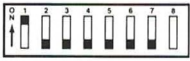
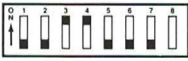
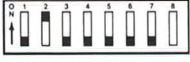
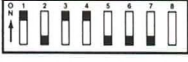
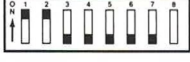
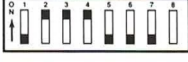









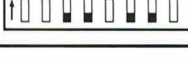
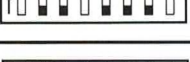
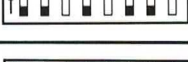


512KB Total Memory




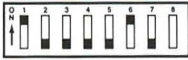
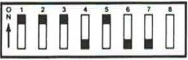
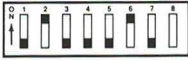
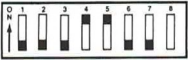
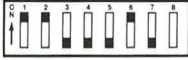
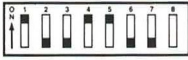
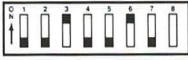













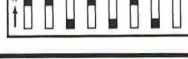
Cluster Adapter Switch Settings

The following figure shows the settings for switches 1 through 6 of Switch Block 1 for station addresses 0 to 21.


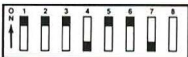
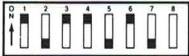

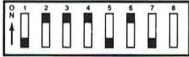









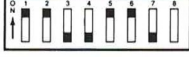





Position 7 of Switch Block 1 is always set to Off.

Station Address	Switch Block 1	Station Address	Switch Block 1
0		11	
1		12	
2		13	
3		14	
4		15	
5		16	
6		17	
7		18	
8		19	
9		20	
10		21	

The following figure shows the settings for switches 1 through 6 of Switch Block 1 for station addresses 22 to 43.

Station Address	Switch Block 1	Station Address	Switch Block 1
22		33	
23		34	
24		35	
25		36	
26		37	
27		38	
28		39	
29		40	
30		41	
31		42	
32		43	

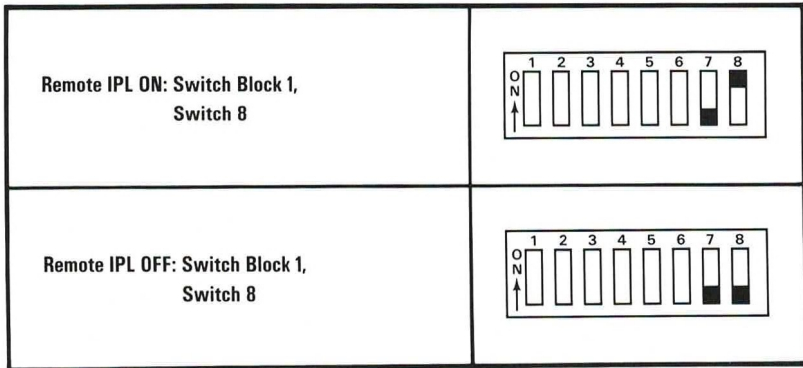
The following figure shows the settings for switches 1 through 6 of Switch Block 1 for station addresses 44 to 63.

Station Address	Switch Block 1	Station Address	Switch Block 1
44		55	
45		56	
46		57	
47		58	
48		59	
49		60	
50		61	
51		62	
52		63	
53			
54			

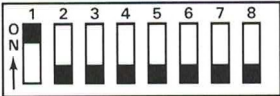
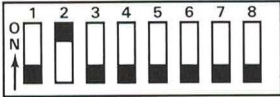
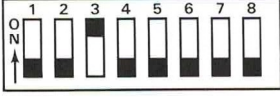
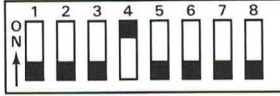
The following figure shows the switch setting for switch 8 of Switch Block 1.

With switch 8 of Switch Block 1 set to On, the Personal Computer will request an IPL from another station on the Cluster. This request delays the POST test completion by 30 seconds.

The recommended switch setting is IPL Off.



The following figure shows the settings for switches 1 through 4 of Switch Block 2 for adapter numbers 1 through 4.

<p>Select Adapter 1: Switch Block 2, Switch 1</p>	 <p>A diagram of a switch block with 8 switches labeled 1 through 8. To the left of the switches is a vertical label 'ON' with an upward-pointing arrow. Switch 1 is in the 'ON' position (top half white, bottom half black). Switches 2 through 8 are in the 'OFF' position (top half black, bottom half white).</p>
<p>Select Adapter 2: Switch Block 2, Switch 2</p>	 <p>A diagram of a switch block with 8 switches labeled 1 through 8. To the left of the switches is a vertical label 'ON' with an upward-pointing arrow. Switch 2 is in the 'ON' position (top half white, bottom half black). Switches 1, 3, 4, 5, 6, 7, and 8 are in the 'OFF' position (top half black, bottom half white).</p>
<p>Select Adapter 3: Switch Block 2, Switch 3</p>	 <p>A diagram of a switch block with 8 switches labeled 1 through 8. To the left of the switches is a vertical label 'ON' with an upward-pointing arrow. Switch 3 is in the 'ON' position (top half white, bottom half black). Switches 1, 2, 4, 5, 6, 7, and 8 are in the 'OFF' position (top half black, bottom half white).</p>
<p>Select Adapter 4: Switch Block 2, Switch 4</p>	 <p>A diagram of a switch block with 8 switches labeled 1 through 8. To the left of the switches is a vertical label 'ON' with an upward-pointing arrow. Switch 4 is in the 'ON' position (top half white, bottom half black). Switches 1, 2, 3, 5, 6, 7, and 8 are in the 'OFF' position (top half black, bottom half white).</p>

Switches 5 through 8 of Switch Block 2 are always set to Off.

Note: If one Cluster Adapter is installed, it must be set as adapter number one. Each additional adapter must have a different Cluster Adapter number.

SECTION 7. PARTS CATALOG

Contents

Limited Warranty Statement	7-2
How To Use This Parts Catalog	7-3
Visual Index	7-4
System Unit (5155)	7-5
System Unit (5155)	7-6
System Unit (5155)	7-8
Expansion Unit (5161)	7-10
Expansion Unit (5161)	7-12
Color Display (5153)	7-14
Diskette Drive	7-16
Fixed Disk Drive	7-18
Keyboard	7-20
Keybutton Part Numbers — U.S.	7-22
Keybutton Kit Part Numbers	7-23
Keybutton Kits	7-25
Graphics Printer (5152)	7-26
Graphics Printer (5152)	7-28
Compact Printer	7-30
Power Cord	7-32

Limited Warranty Statement

The International Business Machines Corporation warrants that each IBM Service Part for an IBM Personal Computer Product will be free from defects in materials and workmanship under conditions of normal use for a period of 90 days from the date of purchase from IBM. Service Parts will be either reconditioned parts or new parts. Should an IBM Service Part fail to be free from defects in materials or workmanship at any time during the 90-day warranty period, IBM will, at its option, repair or replace this Service Part at no charge. All replaced Service Parts will become the property of IBM. This limited warranty does not include damage to the Service Part resulting from accident, disaster, misuse, abuse, or non-IBM modification of the Service Part.

Limited Warranty service may be obtained by delivering the defective Service Part to the IBM location where the part was purchased and providing proof of purchase date. Contact IBM by writing to IBM National Parts Center, P.O. Box 481, Greencastle, Indiana 46135 for further information.

ALL EXPRESS AND IMPLIED WARRANTIES FOR THIS IBM SERVICE PART INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED IN DURATION TO A PERIOD OF 90 DAYS FROM THE DATE OF PURCHASE, AND NO WARRANTIES, WHETHER EXPRESS OR IMPLIED, WILL APPLY AFTER THIS PERIOD. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU.

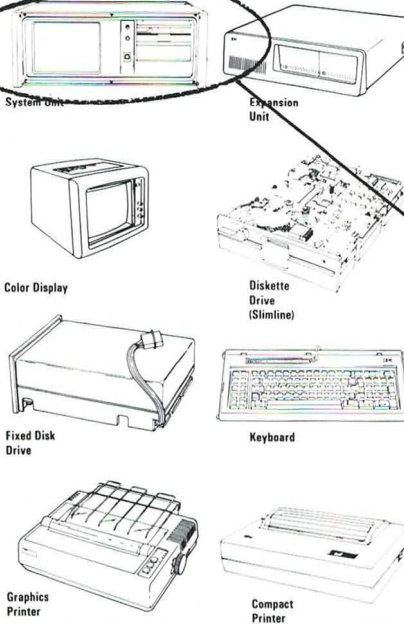
IF THIS IBM SERVICE PART IS DEFECTIVE IN MATERIALS OR WORKMANSHIP UNDER CONDITIONS OF NORMAL USE, AS WARRANTED ABOVE, YOUR SOLE REMEDY SHALL BE REPAIR OR REPLACEMENT AS PROVIDED ABOVE. IN NO EVENT WILL IBM BE LIABLE TO YOU FOR ANY DAMAGES, INCLUDING LOST PROFITS, LOST SAVINGS OR OTHER INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OF OR INABILITY TO USE SUCH IBM SERVICE PART, EVEN IF IBM HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, OR FOR ANY CLAIM BY ANY OTHER PARTY.

SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES FOR CONSUMER PRODUCTS, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH MAY VARY FROM STATE TO STATE.

How To Use This Parts Catalog

Visual Index



1
Turn to the visual index then locate, by illustration, the assembly containing the part.

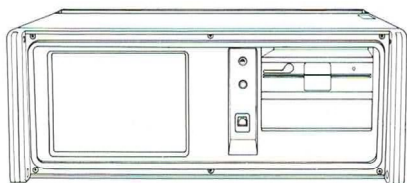
2
Turn to the page for that assembly. Then locate the part visually.

3
Using the index number shown with the part, refer to the accompanying listing to obtain major unit code, part number and description.

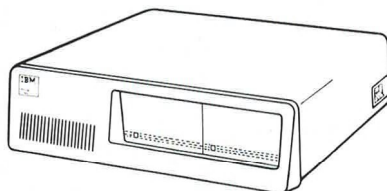
System Unit

Major Unit Code	Index No.	Part Number	Description
000		8654418	Carrying case
000	1	8654413	Panel assembly
000	2	8654414	Cover assembly
000		8654447	Cover
000	4	8654449	Cover, handle assembly
000	5	8654440	Panel assembly kit
			Panel assembly (rear access)
			Panel retainer kit
			Cover and handle hardware kit
			- Consisting of -
			Foam pad
			Washer, friction (2)
			Nut, stud (2)
			Screw shoulder M4 (2)
		8654445	IBM label

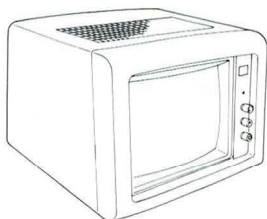
Visual Index



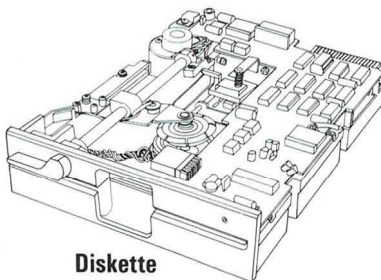
System Unit
Page 7-5



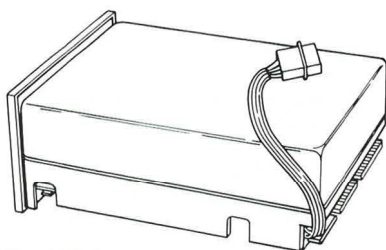
Expansion Unit
Page 7-10



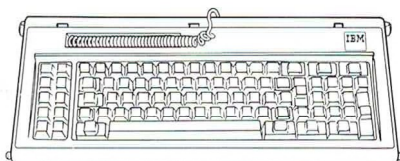
Color Display
Page 7-14



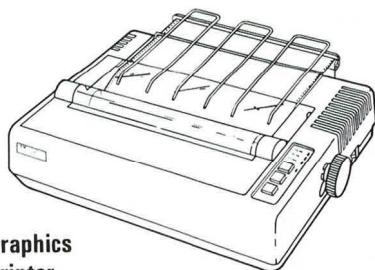
Diskette Drive (Slimline)
Page 7-16



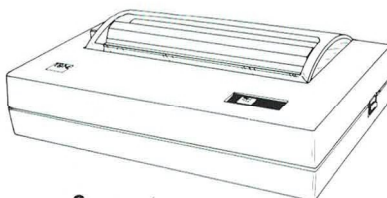
Fixed Disk Drive
Page 7-18



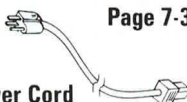
Keyboard
Page 7-20



Graphics Printer
Page 7-26

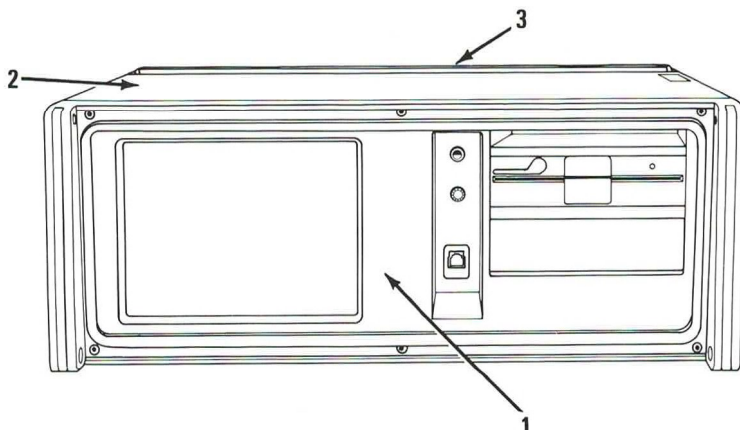


Compact Printer
Page 7-30



Power Cord
Page 7-32

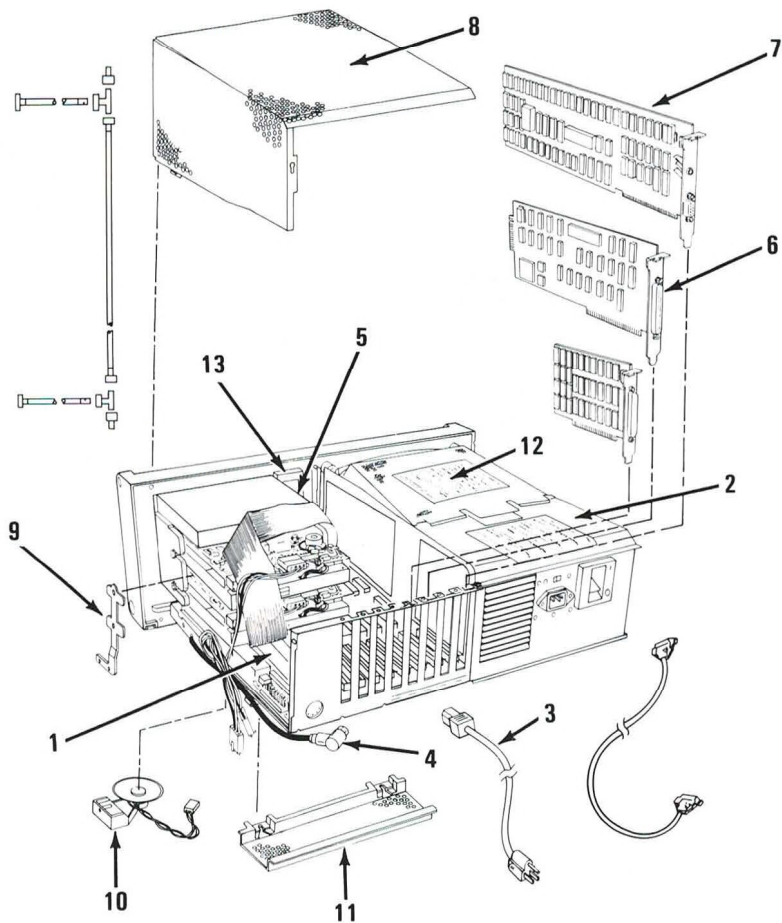
System Unit (5155)



System Unit

Major Unit Code	Index No.	Part Number	Description
000		8654418	Carrying case
000	1	8654413	Panel assembly
000	2	8654414	Cover assembly
000		8654447	Cover
000	3	8654449	Cover, handle assembly
000		8654440	Panel assembly kit
			Panel assembly (rear access)
			Panel retainer kit
		8654439	Cover and handle hardware kit
			- Consisting of -
			Foam pad
			Washer, friction (2)
			Nut, stud (2)
			Screw shoulder M4 (2)
		8654445	IBM label

System Unit (5155)

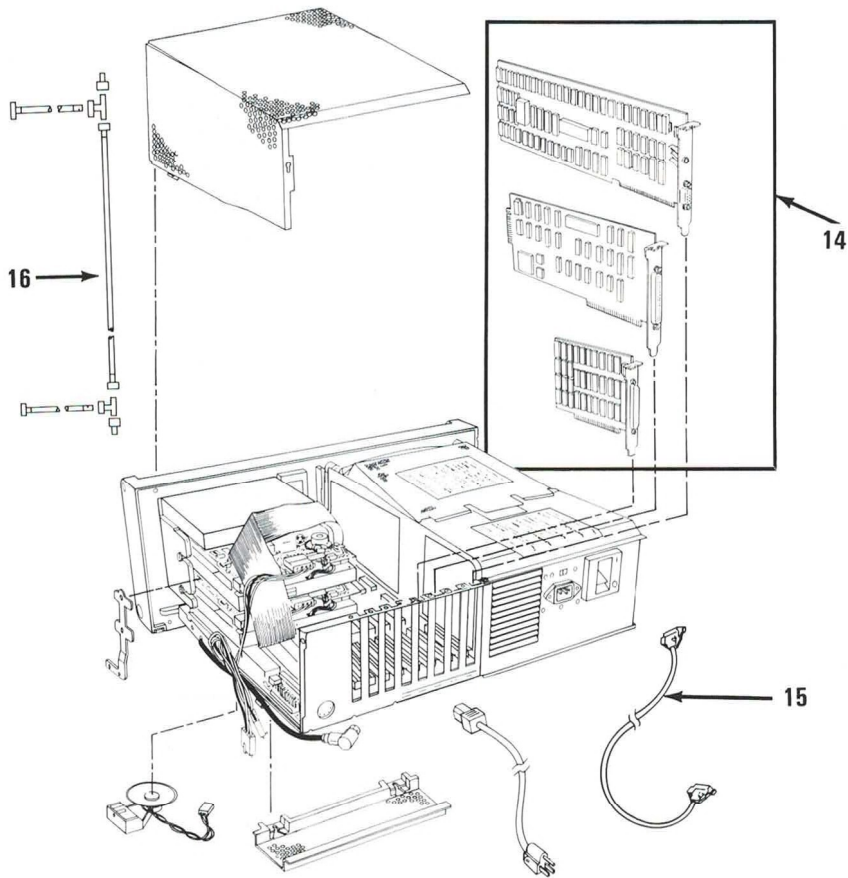


System Unit (5155)

Major Unit Code	Index No.	Part Number	Description
311	1	8529254	System board (without memory)
600	2	8654417	Power supply (with information label)
600	3	8529158	Power cord *
600		8654444	Fan, power supply
301		8529211	64Kb Memory Module (Qty. 1)
000	4	8654427	Cable, keyboard (internal system)
000	5	8654451	Shield, keyboard (internal system)
213	6	8529152	5-1/4" Diskette Drive Adapter
301	7	8286097	Color/Graphics Monitor Adapter
000	8	8654415	Shield
000	9	8654421	Diskette ground bracket
000	10	8529143	Speaker and cable
000	11	8654452	Cable raceway
050	12	8654419	Display assembly
050		8285973x	Logic board
050		8285974x	CRT
050		8285975x	High voltage transformer
050		8285976x	Yoke
050	13	8285977x	Brightness/Contrast assembly
050		8654441	Display assembly hardware kit
			Knob, brightness
			Knob, contrast
			x Restricted availability

*See Power Cord Parts List for proper power cord certified for your country.

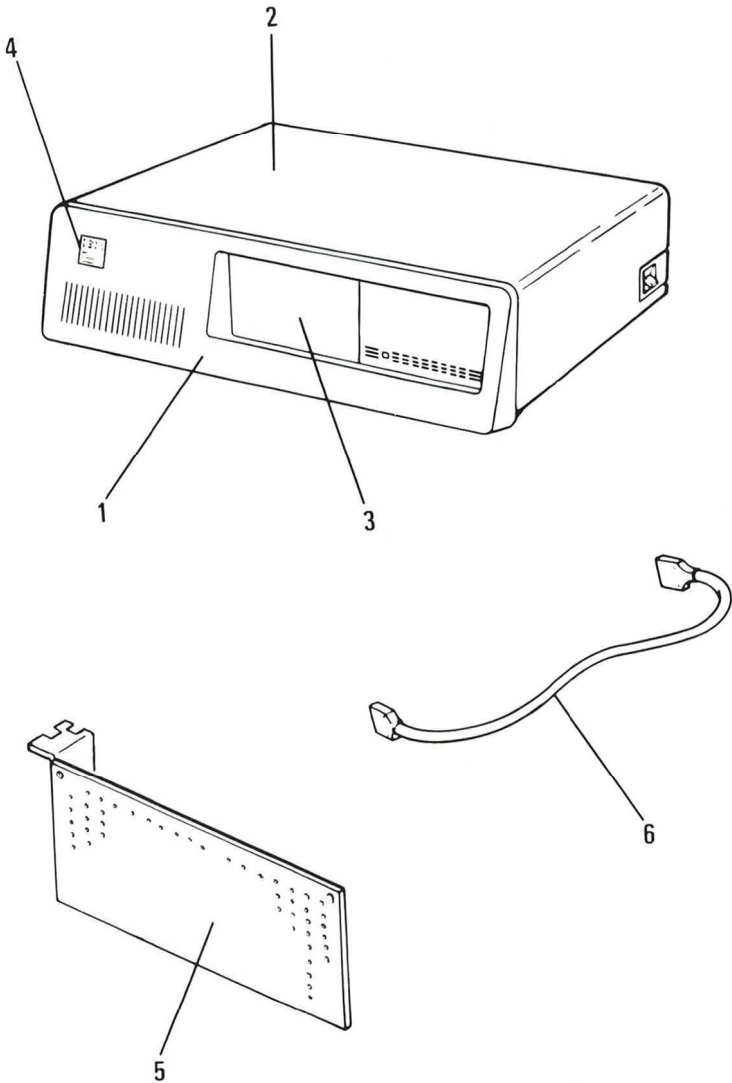
System Unit (5155)



System Unit (5155)

Major Unit Code	Index No.	Part Number	Description
			— Optional Parts —
312	14	6323445	Extender Card
315	14	8529151	Game Control Adapter
350	14	8529213	Prototype Card
319	14	8654401	64/256KB Memory Expansion OPTION CARD (Does not include 64KB Memory modules)
102	14	8529295	Synchronous Data Link Control Communications Adapter
106	14	8529296	Binary Synchronous Communications Adapter
110	14	6323472	Cluster Adapter
317	14	8529149	Printer Adapter
100	14	8529150	Asynchronous Communications Adapter
106	15	8529274	Communication adapter cable
	16	6323575	IBM Cluster cable kit
311		8529147	Math Coprocessor and 8088 Processor
		8654438	Front panel, hardware kit — Consisting of — Foot assembly (2) Panel, bumper Screw, plastite (2) Panel, keyboard connector Diskette drive, blank insert Screw, attach shroud M-4 (6) Strip, wear, front panel (2) Screw, ctrls to panel (2)
		8654442	System hardware kit — Consisting of — System board mounting clips (6) Screws, socket head 3.5mm x 8 (16) Bumper, card (3) Screw, plastite 8-18 (6) Mounting screws, diskette (4) Attachment card, blank insert Glide, chassis (2) Bracket, planar ground Spacer diskette drive (3) Screw, spcl. bristol (7)

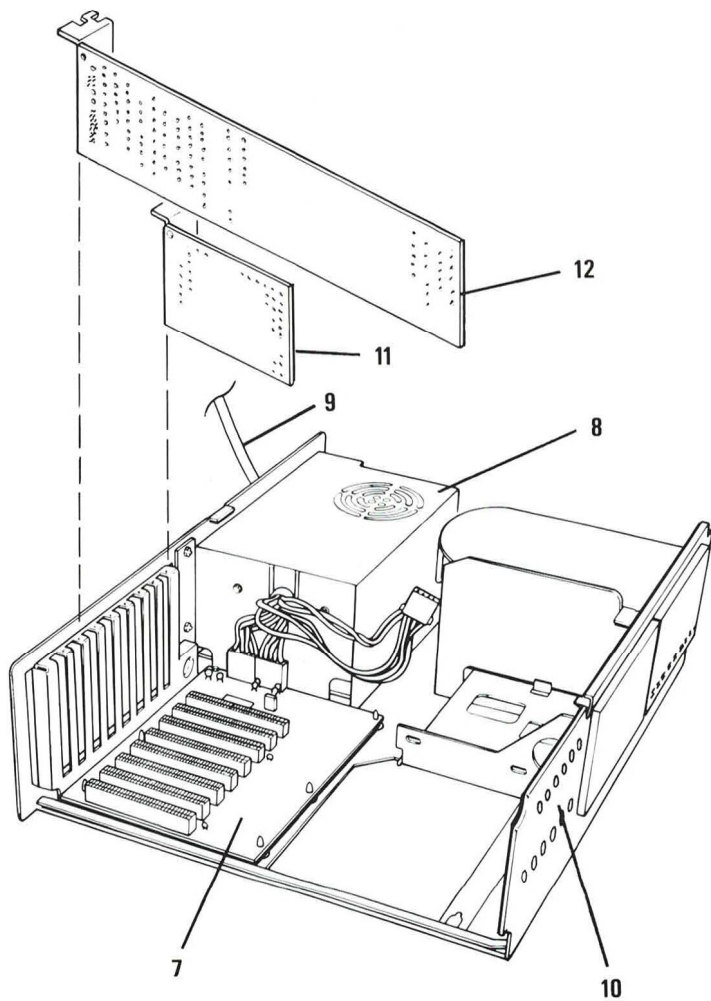
Expansion Unit (5161)



Expansion Unit (5161)

Major Unit Code	Index No.	Part Number	Description
000	1	8529163	Bezel assembly
000	2	8529162	Cover assembly
000	3	8529204	Disk cover plate
000	4	8529164	Label Kit - Consisting of - Label Rear Name Plate FCC Label
312	5	8529252	Extender card (must be installed in system unit)
312	6	8529253	Expansion unit cable

Expansion Unit (5161)

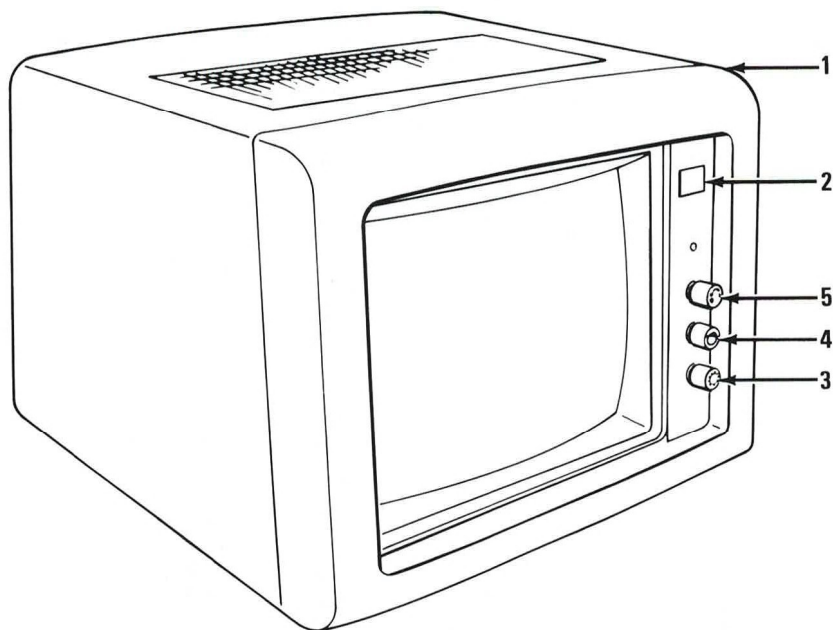


Expansion Unit (5161)

Major Unit Code	Index No.	Part Number	Description
311	7	8529250	Expansion board
600	8	8529247	Power supply
600	9	8529158	Power cord*
000	10	8529248	Base assembly
314	11	8529251	Receiver card
325	12	8529269	Fixed Disk Drive Adapter

*See Power Cord Parts List for proper power cord certified for your country.

Color Display. (5153)

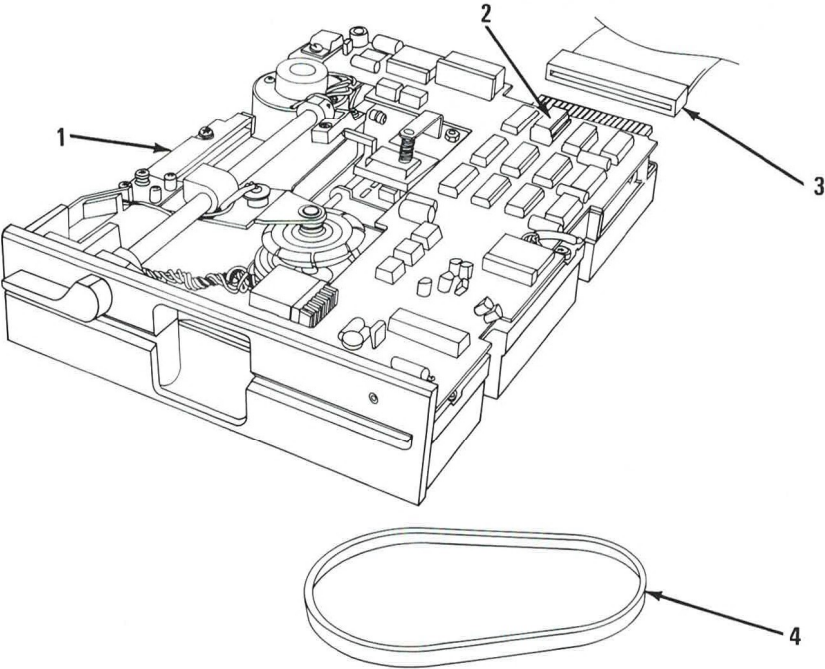


Color Display (5153)

Major Unit Code	Index No.	Part Number	Description
202	1	8529227	Display assembly
202	1	8654214	Display assembly model-002
202	2	8529339	Label kit
202	3	8529287	Brightness knob
202	4	8529288	Contrast knob
202	5	8529289	Power On/Off knob
202		8529158	Power cord*
		8529285x	Front cover with top, bottom, and power supply brackets
		8529286x	Rear cover
		8529323x	P.C. Board Flyback transformer Focus pack/ Horizontal drive Transistor/Chassis
		8654222x	P.C. Board Flyback transformer control assembly model-002
		8654275x	Degaussing coil
		8529338x	Control assembly
		8654224x	Control assembly model-002
		8654276x	Power-On indicator
		8654291x	Power supply assembly
		8654221x	Power supply assembly model-002
		8529290x	CRT and yoke
		8529324x	CRT drive board and shield cable
		8529334x	Signal cable
		8529336x	Power receptacle/line filter assembly
		8654223x	Power receptacle/line filter assembly model-002
		8529335x	Vertical Size pot shaft extension
		8529337x	Vertical Hold pot shaft extension
		8529327x	Misc. hardware kit - Consisting of - Driver board shield Driver board shield retainers Signal cord strain relief Power supply screws CRT mounting screws CRT mounting washers Control assembly screws P.C. Board chassis mounting screws Rear cover screws and washers Cover screw plugs Degaussing coil wire ties
		6937192x	Packing material kit
			x Restricted availability

*See Power Cord Parts List for proper power cord certified for your country.

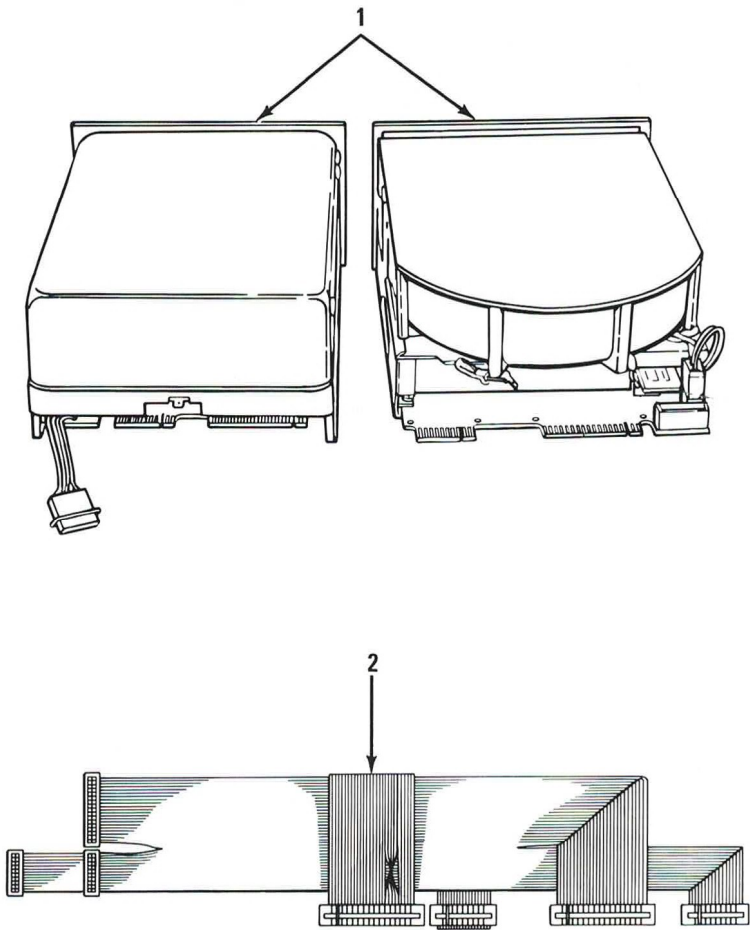
Diskette Drive



Diskette Drive

Major Unit Code	Index No.	Part Number	Description
873	1	8285978	Drive assembly
873	2	8285972	Terminator
873	3	8654420	Signal cable
873	4	8285979	Belt

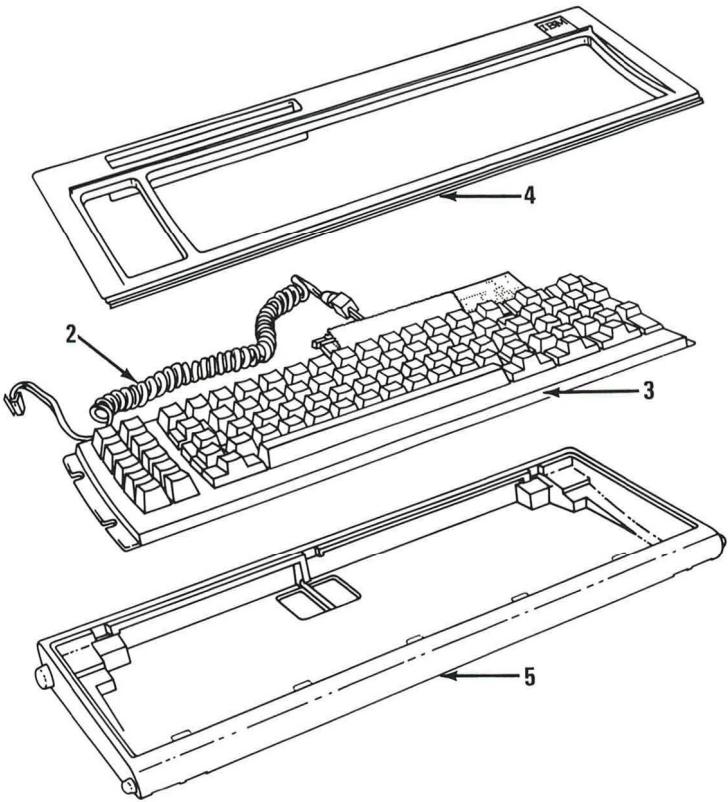
Fixed Disk Drive



Fixed Disk Drive

Major Unit Code	Index No.	Part Number	Description
865	1	8529275	Fixed disk drive
865	2	8529271	Data/control cable

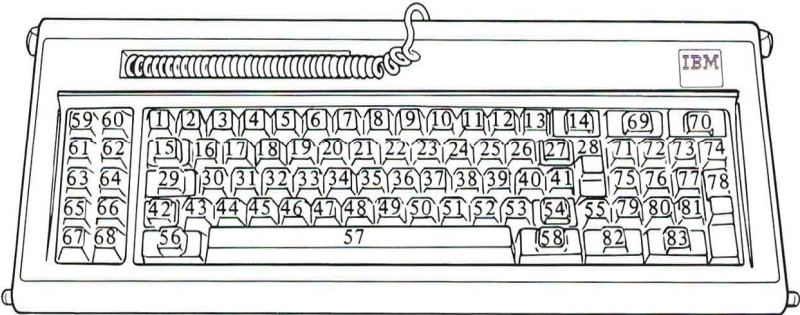
Keyboard



Keyboard

Major Unit Code	Index No.	Part Number	Description
040	1	8654422	Keyboard assembly U.S. w/cable
040	1	8654428	Keyboard assembly U.K. w/cable
040	1	8654429	Keyboard assembly German w/cable
040	1	8654430	Keyboard assembly Spanish w/cable
040	1	8654431	Keyboard assembly Italian w/cable
040	1	8654432	Keyboard assembly French w/cable
040	2	8654426	Cable assembly
040	3	8654423	Keypad assembly U.S.
040	3	8654433	Keypad assembly U.K.
040	3	8654434	Keypad assembly German
040	3	8654435	Keypad assembly Spanish
040	3	8654436	Keypad assembly Italian
040	3	8654437	Keypad assembly French
040	4	8654425	Top cover
040	5	8654424	Bottom cover
040		8654443	Kit, keyboard (misc. parts)
			Foot, support (2)
			Cup, spring (2)
			Spring (2)
			Cup, plunger (2)
			Pin, support (2)
			Spring, plunger (2)
			Pad (5)
			Screw, plastite (2)

Keyboard

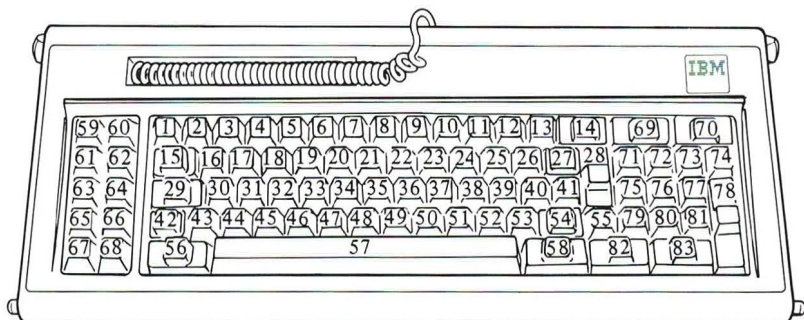


Keybutton Part Numbers--U.S.

(Major Unit Code 040)

Key Location	Part Number	Description
1	4584714	Esc
2	1761460	!/1
3	1642308	@/2
4	1642309	#/3
5	1642342	\$/4
6	1642343	%/5
7	4496183	^/6
8	2658824	&/7
9	2658825	* /8
10	2658826	/ (9
11	2658827) /0
12	1761515	- /.
13	2658829	+ / =
14	1643315	←
15	1643316	← / →
16	2658832	Q
17	2658833	W
18	2658834	E
19	2658835	R
20	2658836	T
21	2658837	Y
22	2658838	U
23	2658839	I
24	2658840	O
25	2658841	P
26	4585286	{ / [
27	4585288	} /]
28	5184235	←
29	4584717	Ctrl
30	2658846	A
31	2658847	S
32	2658848	D
33	2658849	F
34	2658850	G
35	2658851	H
36	2658852	J
37	2658853	K
38	2658854	L
39	2658855	: / ;
40	4584779	" / '
41	1642306	~ / `
42	2658858	↑

Key Location	Part Number	Description
43	5997221	;/ \
44	2658860	Z
45	2658861	X
46	2658862	C
47	2658863	V
48	2658864	B
49	2658865	N
50	2658866	M
51	1864026	< / ,
52	1864027	> / .
53	2658869	? /
54	2658870	↑
55	4584718	* / PrtSc
56	1643330	Alt
57	N/A	SPACE BAR
58	4584719	Caps Lock
59	4584720	F1
60	4584721	F2
61	4584722	F3
62	4584723	F4
63	4584724	F5
64	4584725	F6
65	4584726	F7
66	4584727	F8
67	4584728	F9
68	4584729	F10
69	4584730	Num Lock
70	4584731	Scroll Lock
71	4584732	7 / Home
72	4584733	8 / ↑
73	4584734	9 / Pg Up
74	1761511	-
75	4584735	4 / ←
76	2658892	5 /
77	4584736	6 / →
78	1761513	+
79	4584737	1 / End
80	4584739	2 / ↓
81	4584738	3 / Pg Dn
82	4584740	0 / Ins
83	4584741	. / Del



Keybutton Kit Part Numbers

(Major Unit Code 040)

Major Unit Code	Figure Index Number	Part Number	Description
040		4584657	Keybutton Kit U.S.‡
040		8654272	Unique Keybutton Kit Italy**
040		8654274	Unique Keybutton Kit U.K.
040		8654270	Unique Keybutton Kit France**
040		8654271	Unique Keybutton Kit Germany**
040		8654272	Unique Keybutton Kit Spain**
			‡Complete set of keybutton as listed on previous page.
			** Kit contains only keybuttons listed for specified country group on next page.

Keybutton Kits

(Major Unit Code 040)

Country Group Italy	
Key Loca- tion	Descrip- tion
3	"/2
4	£/3
7	&/6
8	//7
9	/ 8
10) 9
11	=/0
12	?/1
13	~/;
26	é/è
27	* / +
39	@ /ô
40	# /à
41	\$/ù
43	> / <
51	: / ,
52	: / .
53*	_ / -

Country Group U.K.	
Key Loca- tion	Descrip- tion
3	"/2
4	£/3
40	@ /'
41	~/#

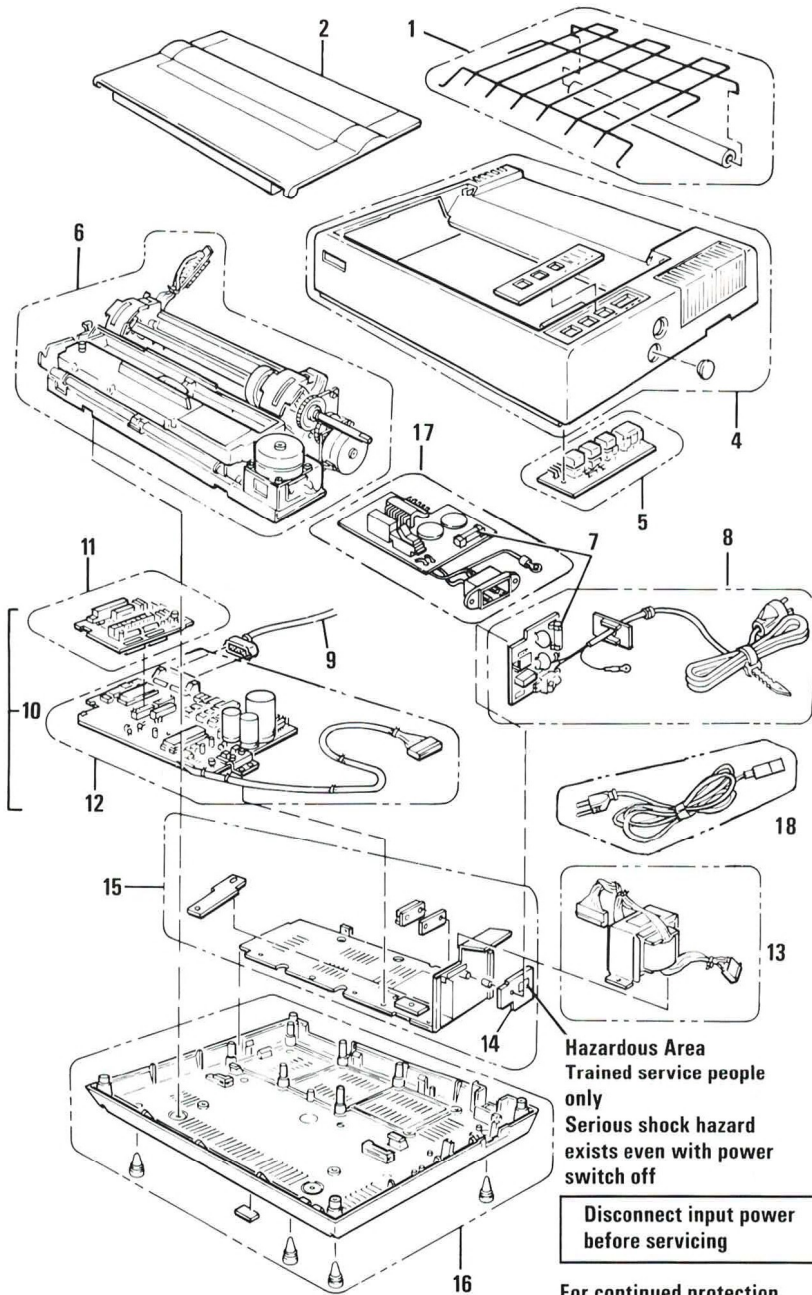
Country Group France	
Key Loca- tion	Descrip- tion
2	1/&
3	2/é
4	3/'
5	4/'
6	5/
7	6/§
8	7/è
9	8/!
10	9/ç
11	0/à
12	° /)
13*	_ / -
16*	A
17*	Z
26	"/ ^
27	* / \$
30*	Q
39*	M
40	% / ù
41	£ / µ
43	> / <
44*	W
50	? / ,
51	: / ;
52	// :
53*	+ / =

Country Group Germany	
Key Loca- tion	Descrip- tion
3	"/2
4	\$/3
7	&/6
8	//7
9	/ 8
10) 9
11	=/0
12	?/ 3
13	' /'
21	Z
26	Ü
27	* / +
39	Ö
40	Ä
41	^ / #
43	> / <
44	Y
51	: / ,
52	: / .
53*	_ / -

Country Group Spain	
Key Loca- tion	Descrip- tion
2	i / 1
3	ç / 2
7	//6
26	"/'
27	~/ \
39	Ñ
40*	: / ;
41	Ç
43	> / <
51	? / ,
52	! / .
53*	"/'
55	PrtSc / ^

*Not included in kit. For reference only. Order from U.S. keyboard.

Graphics Printer (5152)



Hazardous Area
 Trained service people
 only
 Serious shock hazard
 exists even with power
 switch off

**Disconnect input power
 before servicing**

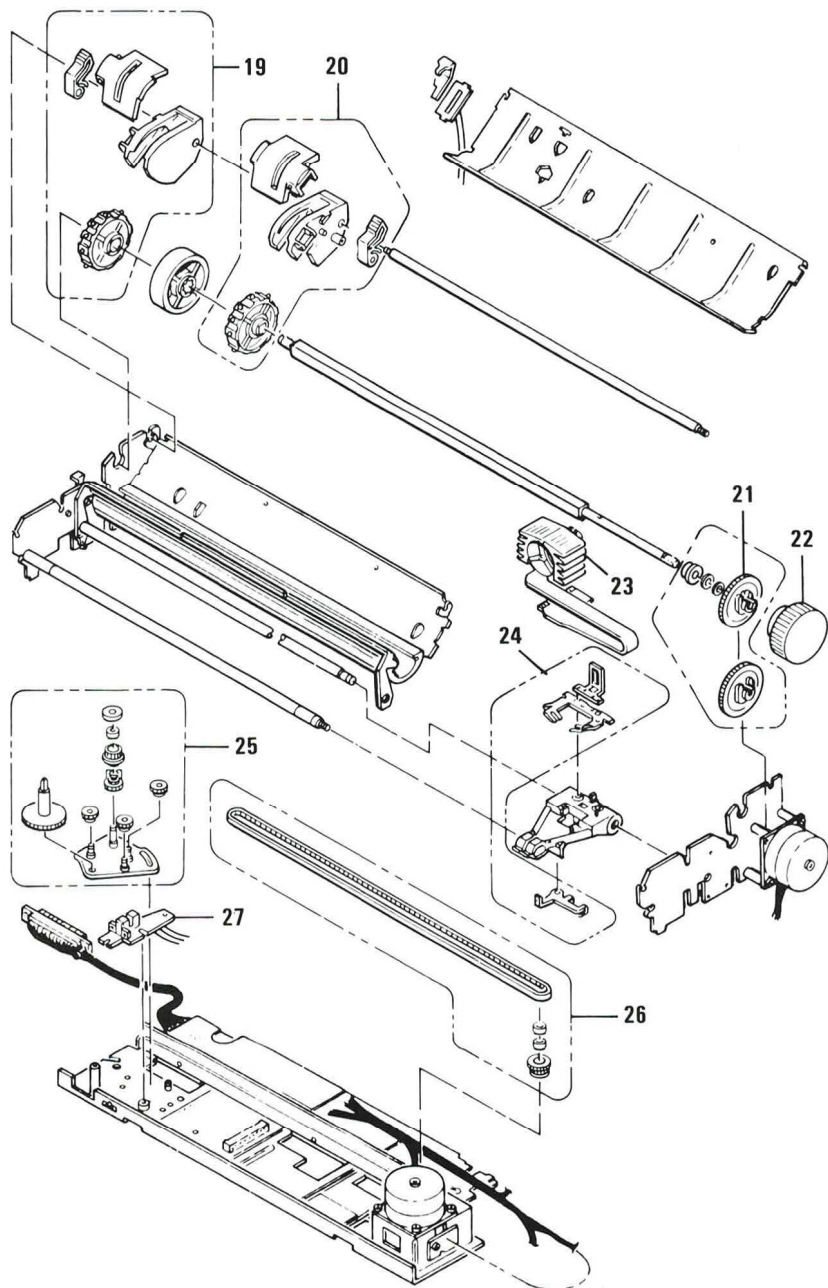
**For continued protection
 against fire hazard, replace
 only with same type and
 rating of fuse**

Graphics Printer (5152)

Major Unit Code	Index No.	Part Number	Description
554	1	8529191	Forms rack
000	2	8529185	Access cover
000	3	8529186	Label kit - Consisting of - Control panel label Nameplate-front Nameplate-rear Warning label bottom Label-FCC Warning label-safety shield 1 ea. 120,220,240 Label-rear
000	4	8529182	Top cover
000	5	8529184	Control Panel
551	6	8529198	Print mechanism assembly
600	7	8529220	Fuse-2A for 120 volt
600	7	8529278	Fuse 315mA for 220/240 volt
600	8	8529187	Fuse-filter card/power cord assembly for 120 volt
600	17	8529279	Fuse-filter card/ AC socket for 220/240 volt
551	9	8529214	Printer cable
318	10	8529197	Control cards - Consisting of -
318	11	8529221x	Driver card
318	12	8529222x	Logic card
600	13	8529196	Power transformer 120 volt
600	13	8654236	Power transformer 220 volt
600	13	8529277	Power transformer 240 volt
600	14	8529215	Safety shield
600	15	8529217	Heat sink/power transistor
000	16	8529181	Base assembly
600	18		Power cord*
			x Restricted availability

*See Power Cord Parts List for proper power cord certified for your country.

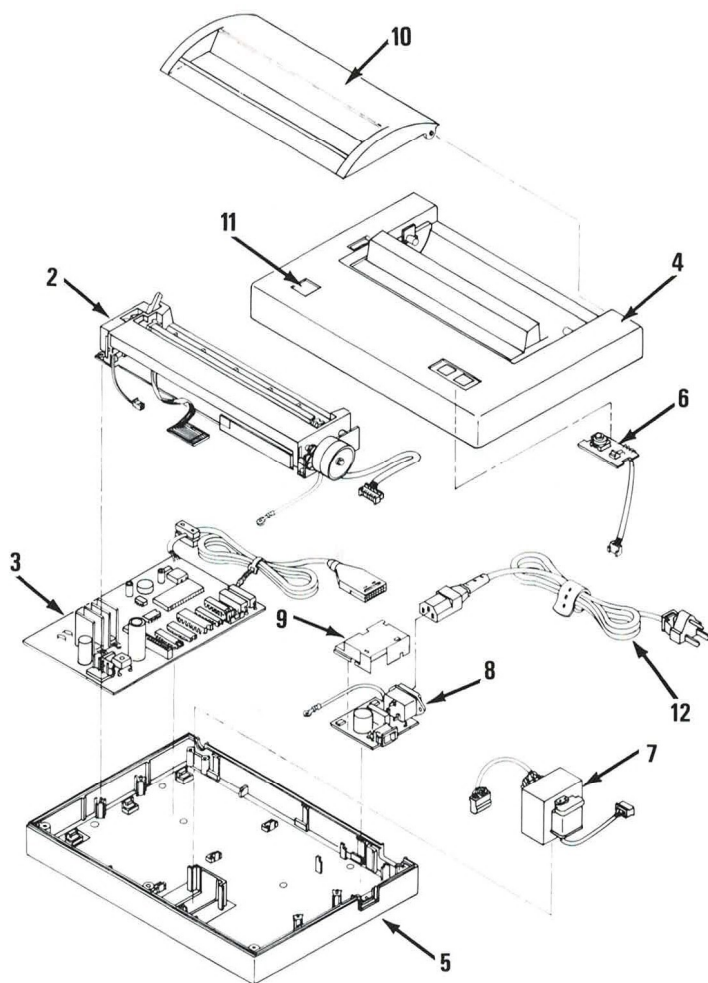
Graphics Printer(5152)



Graphics Printer (5152)

Major Unit Code	Index No.	Part Number	Description
550	19	8529188	Forms tractor assembly, left
550	20	8529216	Forms tractor assembly, right
550	21	8529194	Intermediate gear
550	22	8529193	Forms feed knob
551	23	8529183	Print head
551	24	8529192	Ribbon shield
551	25	8529195	Carriage drive assembly
551	26	8529190	Carriage belt
551	27	8529189	Left margin assembly
000		8529200	Printer miscellaneous hardware - Consisting of - Plane washer C.T.P. screws Retaining rings, type E CP screws with OW Cup screws Spacers Outside toothed lock washers Cup screws (binding head) Hexagon nuts CB screws
000		8529218	Printer miscellaneous springs - Consisting of - Spring pin Leaf spring PE lever spring Headlock lever spring Scale spring, left Scale spring, right Paper holding cover-spring
000		8529219	Printer miscellaneous parts - Consisting of - Board spacing Paper guide roller Grommet Rubber bumper A Rubber bumper B Wire band

Compact Printer

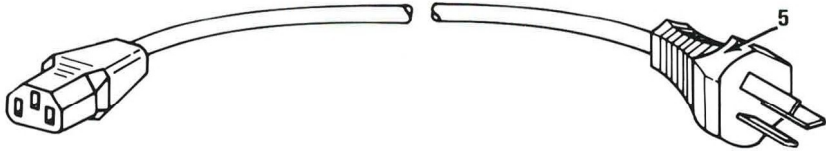
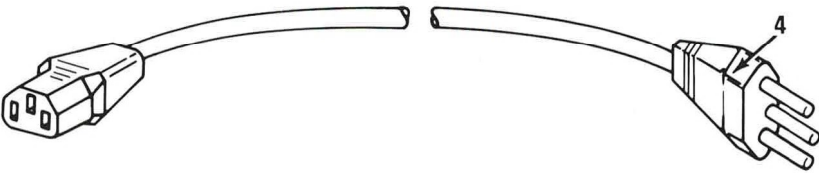
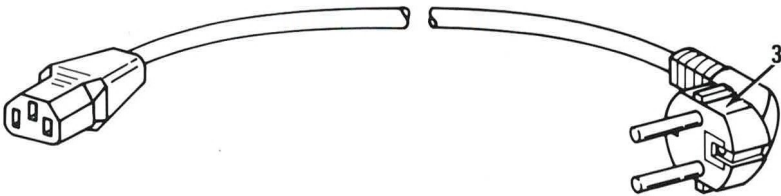
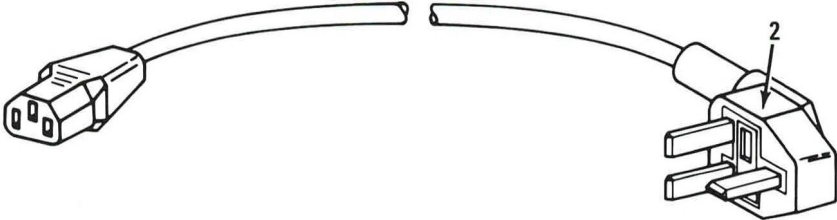
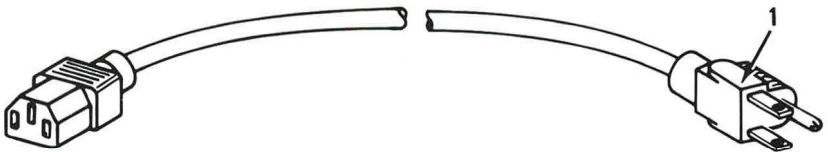


Compact Printer

Major Unit Code	Index No.	Part Number	Description
555	1	8654411	Printer assembly, 120 Volt
555	1	8286109	Printer assembly, 100-110 Volt
555	1	8286110	Printer assembly, 200 Volt
555	1	8286111	Printer assembly, 220-240 Volt
551	2	8654409	Print mechanism
318	3	8654407	Logic card
000	4	8654403x	Top cover
000	5	8654404x	Bottom cover
552	6	8654405x	Control card
600	7	8654406x	Power transformer, 120 Volt
600	7	6323448x	Power transformer, 100-110 Volt
600	7	6323449x	Power transformer, 200 Volt
600	7	6323450x	Power transformer, 220-240 Volt
600	8	8654408x	Power supply card
600	9	6323447x	Safety cover
553	10	8654410x	Access cover
	11	6323446x	Label kit
			- Consisting of -
			Nameplate label front
			Warning label interior
			FCC label
600	12	8286095	Power cord*
			x Restricted availability

*See Power Cord Parts List for proper power cord certified for your country.

Power Cord



Power Cord

Major Unit Code	Index No.	Part Number	Description
600	1	8529158	Power cord U.S. Power cord Venezuela Power cord Colombia
600	2	8529341	Power cord U.K. Power cord Hong Kong Power cord Singapore
600	3	8529281	Power cord Germany Power cord France Power cord Spain
600	4	8529282	Power cord Italy
600	5	8529284	Power cord Australia Power cord New Zealand

Notes:

index

A

- advanced diagnostics 2-9
- advanced diagnostics diskette 2-9
- Alternate Asynchronous Communications
 - adapter address module 4-33
 - location 4-33
 - PIC 3-1200-1
 - test select menu 2-14
- alternate asynchronous communications PIC 3-1200-1
- alternate binary synchronous communications PIC 3-2100-1
- alternate BSC adapter 3-2100-1
- Asynchronous Communications
 - adapter address module 4-33
 - location 4-33
 - PIC 3-1100-1
 - test select menu 2-14
- asynchronous communications adapter wrap plug 2-15
- asynchronous communications PIC 3-1100-1

B

- binary synchronous communications PIC 3-2000-1
- BSC
 - adapter address jumper 4-37

- location 4-37
- part number 7-8
- PIC 3-2000-1
- test select menu 2-14
- BSC adapter PIC 3-2000-1
- BSC adapter wrap plug 2-16

C

- cluster adapter switch settings 6-12
- Color Display
 - diagnostic menu 2-18
 - location 4-39
 - parts 7-14
 - PIC 3-500-1
- color display PIC 3-500-1
- Color/Graphics Monitor Adapter 4-9
 - diagnostic menu 2-18
 - location 4-6, 4-9
 - part number 7-7
 - PIC 3-500-1
 - removal 5-83
 - replacement 5-85
 - switch settings 6-8
 - test select menu 2-14
- communications adapter cable
 - location 4-34
- compact printer 4-27

D

- diagnostic key functions 2-10
- diagnostic menus 2-11

- color/graphics monitor adapter 2-18
- diskette drive and adapter 2-20
- fixed disk drive and adapter 2-21
- installed devices 2-12
- log utilities 2-17
- select an option 2-11
- system checkout 2-13
- test select 2-14
- diagnostics diskette 2-9
- DIP switch 6-3
- diskette drive 4-17
 - diagnostic menu 2-20
 - location 4-9, 4-17
 - part number 7-9
 - parts 7-16
 - PIC 3-600-1
 - removal 5-66
 - replacement 5-71
 - switch settings 6-9
 - test select menu 2-14
- Diskette Drive Adapter 4-9
 - diagnostic menu 2-20
 - location 4-6
 - PIC 3-600-1
 - removal 5-87
 - replacement 5-88
- diskette drive adapter PIC 3-600-1
- diskette drive and adapter menu 2-20
- diskette drive PIC 3-600-1
- diskette drive switch settings 6-9
- display
 - removal, color 5-61
 - removal, internal 5-50
 - replacement, color 5-62
 - replacement, internal 5-55
 - trimmer-capacitor 5-63
 - vertical hold 5-64
 - vertical size 5-65
- display PIC 3-500-1

display switch settings 6-8
drive motor preliminary speed adjustment 5-75
drive motor speed adjustment 5-79

E

expansion board
 PIC 3-1800-1
 removal 5-107
 replacement 5-109
 test select menu 2-14
Expansion Unit
 cover removal 5-111
 cover replacement 5-112
 fixed disk adapter removal 5-122
 fixed disk adapter replacement 5-124
 location 4-29
 option adapter removal 5-120
 option adapter replacement 5-121
 part number 7-13
 parts 7-10, 7-12
 PIC 3-1800-1
 power supply removal 5-113
 power supply replacement 5-119
 removal 5-107
 replacement 5-109
 test select menu 2-14
Extender Card
 location 4-32
 PIC 3-1800-1
 switch settings 6-10

F

Fixed Disk Adapter

- diagnostic menu 2-21

- PIC 3-1700-1

- removal 5-122

- replacement 5-124

- test select menu 2-14

fixed disk drive 4-19

- C removal 5-93

- C replacement 5-96

- D removal 5-100

- D replacement 5-103

- diagnostic menu 2-21

- location 4-19, 4-34

- parts 7-18

- PIC 3-1700-1

- test select menu 2-14

fixed disk drive and adapter menu 2-21

French keyboard 4-14

G

Game Control Adapter

- location 4-35

- PIC 3-1300-1

- test select menu 2-14

German keyboard 4-15

Graphics Printer

- location 4-21

- PIC 3-1400-1

- test select menu 2-14

graphics printer parts 7-26, 7-28

I

- installed devices menu 2-12
- intermittent problem 3-010-10
- introduction to diagnostics 2-3
 - advanced diagnostics diskette 2-9
 - diagnostic menus 2-11
 - loading advanced diagnostics 2-9
 - POST errors 2-5
 - power-on self test 2-3
 - problem isolation charts (PICs) 2-7
 - special key functions 2-10
 - tools and test equipment 2-22
- Italian keyboard 4-16

J

- J1 control connector 4-19
- J2 or J3 data connector 4-19

K

- keyboard 4-10
 - assembly removal 5-44
 - assembly replacement 5-45
 - cover removal 5-43
 - location 4-3, 4-10
 - parts 7-20, 7-22, 7-23, 7-25
 - PIC 3-300-1
 - removal 5-41
 - replacement 5-42
 - test select menu 2-14

L

loading advanced diagnostics 2-9

locations

- access panel 4-4

- asynchronous communications adapter 4-33

- BIOS 4-8

- brightness control 4-3

- BSC adapter 4-37

- cable raceway 4-7

- cluster adapter 4-38

- CN1 4-23

- CN2 4-21, 4-23

- CN3 4-21, 4-23

- CN4 4-21, 4-23

- CN5 4-21, 4-23

- CN6 4-21, 4-23

- color display 4-39

- color/graphics monitor adapter 4-6, 4-9

- communications adapter cable 4-34

- compact printer 4-27

- contrast control 4-3

- control connector J1 4-19

- data connector J2 or J3 4-19

- diskette drive 4-17

- diskette drive adapter 4-6, 4-9

- diskette drive belt 4-18

- diskette drive power connector 4-17

- diskette drive signal connector 4-17

- diskette drive terminating resistor 4-17

- diskette ground bracket 4-6

- display power connector 4-7

- expansion board 4-30

- expansion option adapter 4-30

- expansion slots 4-31
- expansion unit 4-3
 - expansion board 4-30
 - expansion option adapter 4-30
 - expansion slots 4-31
 - fixed disk drive C 4-30
 - fixed disk drive D 4-30
 - option expansion slots 4-29
 - power connector 4-31
 - power supply 4-30, 4-43
 - power supply vent 4-29
 - power switch 4-29
 - receiver card 4-30
- expansion unit option expansion slots 4-29
- expansion unit power supply 4-30
- expansion unit power supply vent 4-29
- expansion unit power switch 4-29
- extender card 4-32
- fixed disk drive 4-19
- fixed disk drive adapter 4-34
- fixed disk drive C 4-30
- fixed disk drive D 4-30
- fixed disk terminating resistor 4-20
- French keyboard 4-14
- front panel, system unit 4-5
- game control adapter 4-35
- German keyboard 4-15
- handle, system unit 4-4
- input voltage selector switch 4-4, 4-41
- internal display 4-5
- internal keyboard cable 4-6, 4-7
- Italian keyboard 4-16
- keyboard 4-3, 4-10
 - adjustable leg handles 4-3
 - assembly with cable 4-10
 - bottom cover 4-10
 - French 4-14
 - German 4-15
 - internal cable 4-7

- internal keyboard cable 4-6
- internal system board connector 4-8
- Italian 4-16
- keyboard connector, front panel 4-3
- keyboard release latches 4-3
- Spanish 4-13
- top cover 4-10
- United Kingdom 4-12
- United States 4-11
- keyboard adjustable leg handles 4-3
- keyboard assembly with cable 4-10
- keyboard bottom cover 4-10
- keyboard connector, front panel 4-3
- keyboard release latches 4-3
- keyboard top cover 4-10
- math coprocessor 4-8
- microprocessor 4-8
- option adapter slots, system unit 4-4
- option locations 4-40
- power connector 4-31
- power supply 4-5
- power supply, system unit 4-4
- power switch, system unit 4-4
- preliminary speed adjustment strobe marks 4-18
- print head 4-22
- print head and cable 4-26
- print head gap adjustment lever 4-22
- print mechanism assembly 4-21
- printer 4-3, 4-21
 - carriage motor 4-21
 - CN1 4-23
 - CN2 4-21, 4-23
 - CN3 4-21, 4-23
 - CN4 4-21, 4-23
 - CN5 4-21, 4-23
 - CN6 4-21, 4-23
 - compact printer ground location 4-45
 - forms feed motor 4-21
 - print head 4-22

- print head gap adjustment lever 4-22
- print mechanism assembly 4-21
- printer adapter 4-36
- printer base cover 4-25
- printer carriage belt 4-22
- printer carriage drive assembly 4-22
- printer control circuit card 4-21
- printer control panel 4-25
- printer control panel connector 4-25
- printer driver circuit card 4-21
- printer end-of forms switch 4-22
- printer forms tractor 4-21
- printer ground location 4-44
- printer head and cable 4-26
- printer heat sink 4-21
- printer intermediate gear 4-22
- printer left margin sensor 4-22, 4-26
- printer platen 4-22
- printer power transformer 4-21
- printer power transistor 4-21
- printer ribbon cartridge 4-21
- printer ribbon shield 4-22
- printer safety shield 4-21
- printer signal cable 4-24
- printer signal connector 4-24
- printer switches 4-23
- printer top cover 4-25
- system unit printer cable connector 4-24
- printer adapter 4-36
- printer base cover 4-25
- printer carriage belt 4-22
- printer carriage drive assembly 4-22
- printer carriage motor 4-21
- printer control circuit card 4-21
- printer control panel 4-25
- printer control panel connector 4-25
- printer driver circuit card 4-21
- printer end-of-forms switch 4-22
- printer forms feed motor 4-21

- printer forms tractor 4-21
- printer heat sink 4-21
- printer intermediate gear 4-22
- printer left margin sensor 4-22, 4-26
- printer platen 4-22
- printer power transformer 4-21
- printer power transistor 4-21
- printer ribbon cartridge 4-21
- printer ribbon shield 4-22
- printer safety shield 4-21
- printer signal cable 4-24
- printer signal connector 4-24
- printer switches 4-23
- printer top cover 4-25
- prototype card 4-36
- receiver card 4-30, 4-32
- ROM 4-8
- safety ground locations 4-42
- SDLC adapter 4-37
- shield, system unit 4-5
- Spanish keyboard 4-13
- speaker 4-7
- speaker connector 4-8
- system board 4-8
- system board color trimmer capacitor 4-8
- system board expansion slots 4-8
- system board keyboard connector 4-8
- system board memory 4-8
- system board power connectors 4-8
- system board standoffs 4-7
- system board switches 4-8
- system unit 4-3
 - access panel 4-4
 - BIOS 4-8
 - brightness control 4-3
 - cable raceway 4-7
 - color trimmer capacitor 4-8
 - color/graphics monitor adapter 4-6
 - contrast control 4-3

- diskette drive adapter 4-6
- diskette drive bracket 4-6
- display 4-5
- display power connector 4-7
- expansion slots 4-8
- front panel 4-5
- handle 4-4
- input voltage switch 4-4
- internal keyboard cable 4-6, 4-7
- internal keyboard connector 4-8
- math coprocessor 4-8
- microprocessor 4-8
- option adapter slots 4-4
- power connector 4-8
- power supply 4-4, 4-5
- power switch 4-4
- ROM 4-8
- shield 4-5
- speaker 4-7
- speaker connector 4-8
- standoffs 4-7
- support legs 4-3
- switch block 4-8
- 64K memory module 4-8
- system unit printer cable connector 4-24
- system unit support legs 4-3
- U. S. english keyboard 4-11
- United Kingdom english keyboard 4-12
- 64/256KB memory expansion option adapter 4-35
- 8088 4-8
- log utilities menu 2-17

M

- Math Coprocessor
 - location 4-8

- PIC 3-700-1
 - switch settings 6-6
 - test select menu 2-14
- memory
 - location 4-8
 - part number 7-9
 - PIC 3-200-1
 - switch settings 6-11
 - test select menu 2-14
- memory expansion option switch settings 6-11
- monitor switch settings 6-8

O

- option selection menu 2-11
- options 1-4

P

- part number
 - asynchronous communications adapter wrap plug 2-15
 - BSC adapter 7-9
 - BSC adapter wrap plug 2-16
 - Color/Graphics Monitor Adapter 7-7
 - Diskette Drive Adapter 7-7
 - Extender Card 7-9
 - Game Control Adapter 7-9
 - keyboard cable 7-7
 - memory module 7-9
 - part number 7-11
 - power supply 7-9
 - printer adapter wrap plug 2-15
 - Prototype Card 7-11

- SDLC communications adapter 7-11
- SDLC communications adapter wrap plug 2-15
- visual index 7-5
- 5 1/4" Diskette Drive Adapter 7-9
- 64/256KB Memory Expansion Option Adapter 7-11
- PIC (problem isolation charts)
 - alternate binary synchronous communications adapter 3-2100-1
 - asynchronous communications adapter 3-1100-1
 - binary synchronous communications adapter 3-2000-1
 - diskette drive 3-600-1
 - display 3-500-1
 - expansion board 3-1800-1
 - expansion unit 3-1800-1
 - extender card 3-1800-1
 - fixed disk adapter 3-1700-1
 - fixed disk drive 3-1700-1
 - game control adapter 3-1300-1
 - graphics printer 3-1400-1
 - keyboard 3-300-1
 - math coprocessor 3-700-1
 - memory 3-200-1
 - power 3-020-1
 - printer adapter 3-900-1
 - receiver card 3-1800-1
- Start 3-3
- synchronous data link control 3-1500-1
- system board 3-100-1
- undetermined problem 3-010-1
- POST errors 2-5
- POST mode switch settings 6-5
- Power PIC 3-020-1
- power supply
 - fan removal 5-19
 - fan replacement 5-20
 - location 4-4
 - part number 7-9
- PIC 3-020-1
- removal 5-14

- replacement 5-17
- power-on self test 2-3
- printer 4-21
- Printer Adapter
 - location 4-36
 - PIC 3-900-1
 - test select menu 2-14
- printer adapter wrap plug 2-15
- printer head and cable 4-26
- printer PIC 3-1400-1
- printer signal cable 4-24
- problem isolation charts (PIC)
 - alternate asynchronous communications adapter 3-1200-1
 - alternate binary synchronous communications adapter 3-2100-1
 - asynchronous communications adapter 3-1100-1
 - binary synchronous communications adapter 3-2000-1
 - diskette drive 3-600-1
 - display 3-500-1
 - expansion board 3-1800-1
 - expansion unit 3-1800-1
 - extender card 3-1800-1
 - fixed disk adapter 3-1700-1
 - fixed disk drive 3-1700-1
 - game control adapter 3-1300-1
 - graphics printer 3-1400-1
 - keyboard 3-300-1
 - math coprocessor 3-700-1
 - memory 3-200-1
 - power 3-020-1
 - printer adapter 3-900-1
 - receiver card 3-1800-1
 - Start 3-3
 - synchronous data link control 3-1500-1
 - system board 3-100-1
 - undetermined problem 3-010-1
- problem isolation charts (PICs) 2-7
- Prototype Card
 - location 4-36

R

Receiver Card

- location 4-30, 4-32

- PIC 3-1800-1

removal and replacement

- Compact printer 5-215

- diskette drive 5-66

 - drive belt removal 5-74

 - drive belt replacement 5-74

 - preliminary speed adjustment 5-75

 - removal 5-66

 - replacement 5-71

 - speed adjustment 5-79

- display 5-50

- expansion unit 5-107

- fixed disk drive 5-93

 - removal, drive C 5-93

 - removal, drive D 5-100

 - replacement, drive C 5-96

 - replacement, drive D 5-103

- introduction 5-5

- keyboard 5-41

- printer 5-127

 - access cover removal 5-154

 - base cover removal 5-161

 - base cover replacement 5-162

 - carriage belt adjustments 5-127

 - carriage belt removal 5-130

 - carriage belt replacement 5-133

 - carriage drive assembly removal 5-135

 - carriage drive assembly replacement 5-137

 - control circuit card removal 5-140

 - control circuit card replacement 5-146

- control panel removal 5-152
- control panel replacement 5-153
- driver circuit card removal 5-149
- driver circuit card replacement 5-151
- forms feed knob removal 5-163
- forms rack removal 5-164
- forms tractor removal 5-165
- forms tractor replacement 5-167
- fuse removal 5-168
- fuse-filter card removal 220/224 volt 5-169
- fuse-filter card replacement--220/240 volt 5-171
- fuse-filter card/power cord removal--120 volt 5-173
- fuse-filter card/power cord replacement--120 volt 5-175
- heat sink/power transistor assembly removal 5-177
- heat sink/power transistor assembly replacement 5-178
- intermediate gear removal 5-179
- intermediate gear replacement 5-181
- left margin sensor adjustment 5-183
- left margin sensor removal 5-190
- left margin sensor replacement 5-192
- power transformer removal 120 volt 5-198
- power transformer removal 220/240 volt 5-194
- power transformer replacement 220/240 volt 5-197
- power transformer replacement--120 volt 5-200
- power transformer 220/240 volt primary power connector
wiring check 5-196
- print head gap adjustment 5-205
- print head removal 5-201
- print head replacement 5-203
- print mechanism assembly removal 5-206
- print mechanism assembly replacement 5-208
- ribbon shield removal 5-211
- ribbon shield replacement 5-212
- safety shield removal 5-214
- top cover removal 5-155
- top cover replacement 5-158
- system unit 5-5, 5-14, 5-21
 - cover removal 5-6
 - cover replacement 5-8

- front cover replacement 5-11
- front panel removal 5-9
- math coprocessor removal 5-28
- math coprocessor replacement 5-30
- memory 5-25
- memory module replacement 5-27
- power supply fan removal 5-19
- power supply fan replacement 5-20
- power supply removal 5-14
- power supply replacement 5-17
- processor removal 5-35
- processor replacement 5-37
- speaker removal 5-39
- speaker replacement 5-40
- system board removal 5-21
- system board replacement 5-23

S

- safety ground locations
 - color display 4-45
 - compact printer 4-45
 - expansion unit power supply 4-43
 - printer 4-44
 - system unit 4-42
- SDLC communications adapter
 - location 4-37
 - part number 7-11
 - PIC 3-1500-1
 - test select menu 2-14
- SDLC communications adapter wrap plug 2-15
- Spanish keyboard 4-13
- special key functions 2-10, 3-010-12
- start PIC 3-3
- switch settings 6-3
 - diskette drive 6-9

- display 6-8
- extender card 6-10
- memory expansion option 6-11
- printer dip switch chart 5-144
- system board 6-4
- system board memory 6-7
- synchronization test, video 2-19
- system board
 - math coprocessor removal 5-28
 - math coprocessor replacement 5-30
 - memory module removal 5-25
 - memory module replacement 5-27
 - PIC 3-100-1
 - processor removal 5-35
 - processor replacement 5-37
 - removal 5-21
 - replacement 5-23
 - speaker removal 5-39
 - speaker replacement 5-40
 - test select menu 2-14
- system board memory switch settings 6-7
- system board switch block 6-4
- system checkout menu 2-13
- system unit 4-3
 - cover removal 5-6
 - cover replacement 5-8
 - front panel removal 5-9
 - front panel replacement 5-11
 - location 4-3
 - memory switch settings 6-7
 - part number 7-7
 - parts 7-6, 7-8, 7-10
 - PIC 3-100-1
 - switch settings 6-4

T

test select menu 2-14
tools and test equipment 2-22

U

U.K. english keyboard 4-12
U.S. english keyboard 4-11
undetermined problem PIC 3-010-1

V

video synchronization test 2-19
video test 2-19
visual index, parts 7-5
010 undetermined problem PIC 3-010-1
020 power PIC 3-020-1
100 system board PIC 3-100-1
1200 alternate asynchronous communications PIC 3-1200-1
1300 game control adapter PIC 3-1300-1
1400 graphics printer PIC 3-1400-1
1500 synchronous data link control communications adapter
PIC 3-1500-1
1700 fixed disk drive PIC 3-1700-1
1800 expansion board PIC 3-1800-1
1800 expansion unit PIC 3-1800-1
1800 extender card PIC 3-1800-1
1800 receiver card PIC 3-1800-1
200 memory PIC 3-200-1
2000 binary synchronous communications PIC 3-2000-1

2100 alternate binary synchronous communications

PIC 3-2100-1

300 keyboard PIC 3-300-1

500 display PIC 3-500-1

600 diskette drive PIC 3-600-1

64/256KB Memory Expansion Option Adapter

location 4-35

part number 7-11

PIC 3-200-1

64/256KB memory expansion option switch settings 6-11

700 math coprocessor PIC 3-700-1

900 printer adapter PIC 3-900-1

Notes:



Reader's Comment Form

HARDWARE MAINTENANCE and SERVICE

1502385

Your comments assist us in improving the usefulness of our publication; they are an important part of the input used for revisions.

IBM may use and distribute any of the information you supply in any way it believes appropriate without incurring any obligation whatever. You may, of course, continue to use the information you supply.

Please do not use this form for technical questions regarding the IBM Portable Personal Computer, or for requests for additional publications. Instead, direct your inquiries or request to your authorized IBM Personal Computer dealer.

Comments:

Tape

Please do not staple

Tape

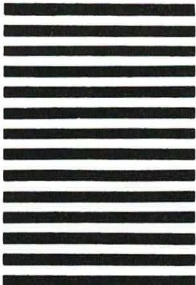
Fold here

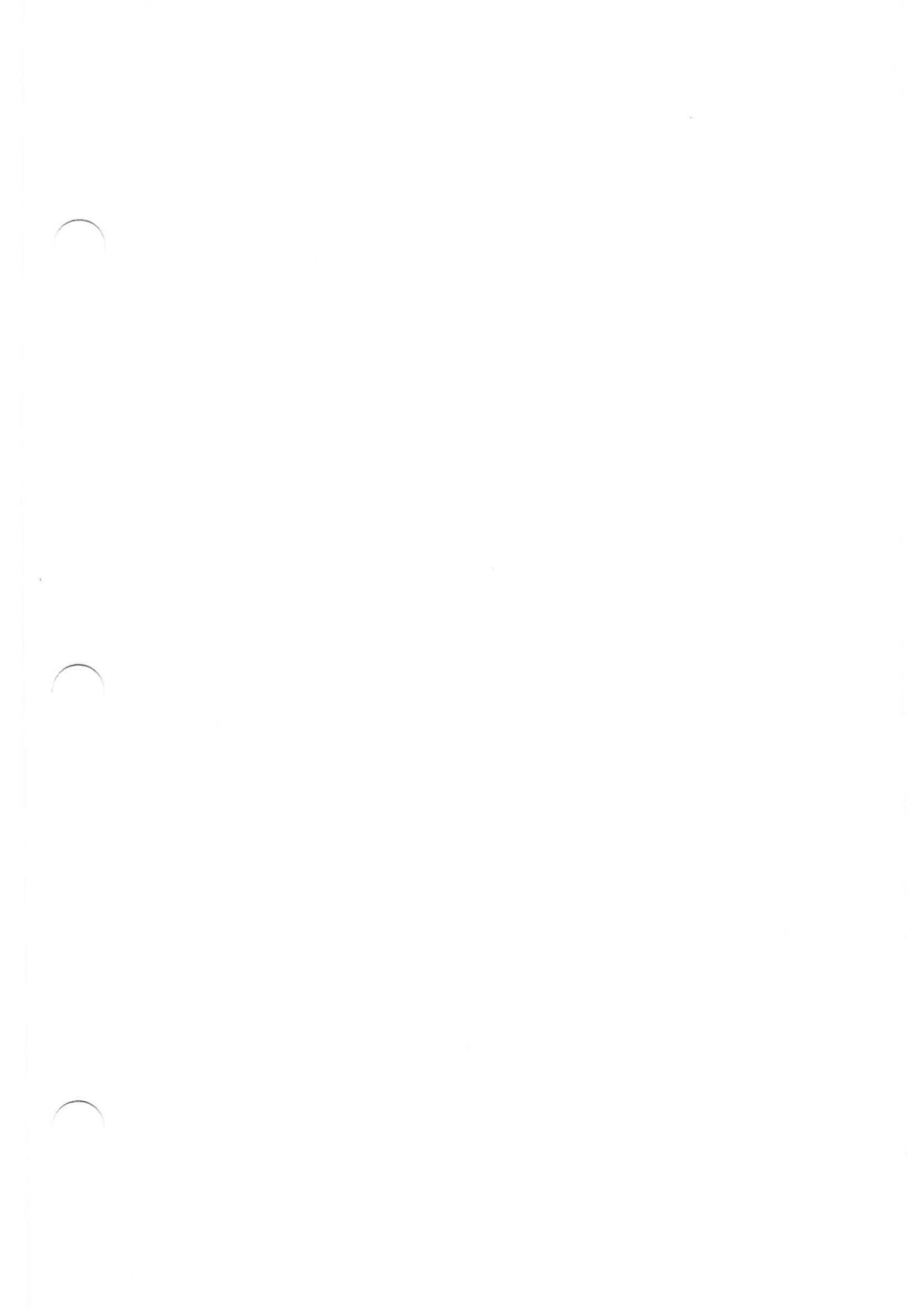
IBM PERSONAL COMPUTER
SALES & SERVICE
P.O. BOX 1328-C
BOCA RATON, FLORIDA 33432

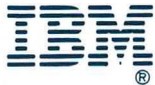
POSTAGE WILL BE PAID BY ADDRESSEE

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 321 BOCA RATON, FLORIDA 33432

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES







International Business Machines Corporation

**P.O. Box 1328-W
Boca Raton, Florida 33432**

1502385

Printed in United States of America